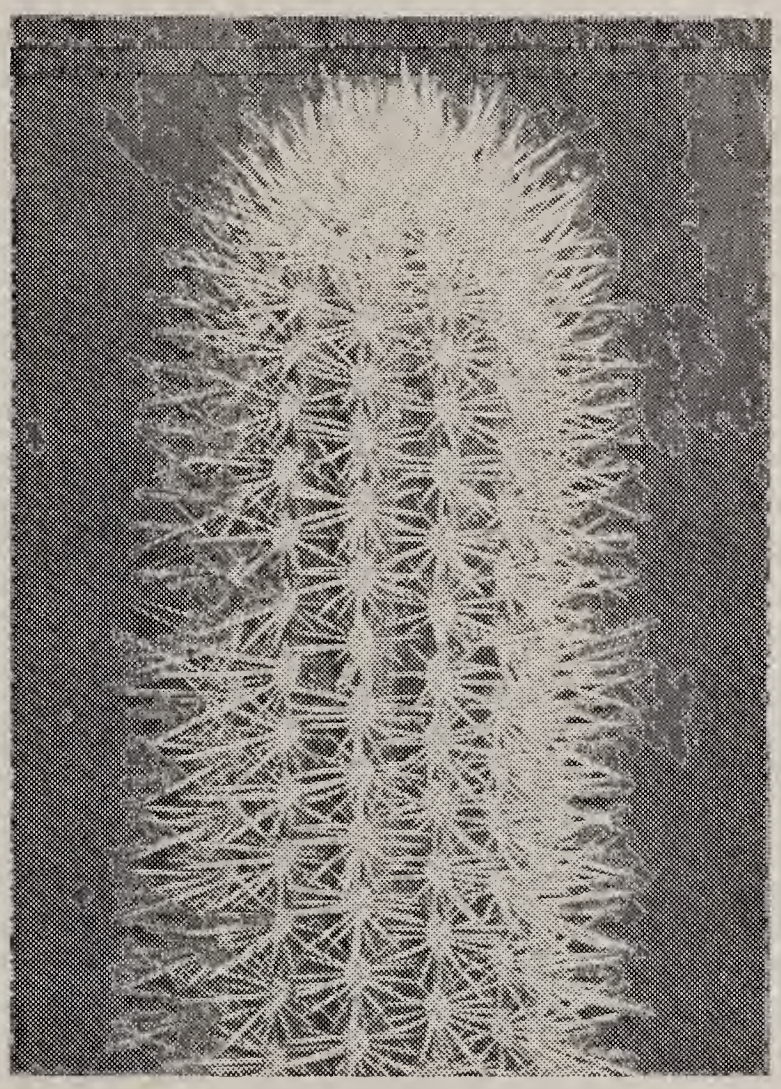
SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

JANUARY, 1957



Pachycereus orcuttii
a seedling grown for us by
H. E. Gates.

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

Volume 11 JANUARY, 1957 No. 1

Arizona Cactus and Native Flora Society

EXECUTIVE BOARD

Chairman of Board .....John H. Eversole
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Desert Botanical Garden of Arizona

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Consulting Botanist....James A. McCleary, Ph.D.
Superintendent .....W. Hubert Earle
Assistant Horticulturist.....Bart Wetzel
Research Associates .....Charles Mieg,
August Hermann, Sylvia Hermann

Garden open every day except Monday, from 10 A.M. to 4:45 P.M.
No charge for admission.

EDITORIAL

1957 and the first number of volume II of Saguaroland Bulletin remind your editor that on December 1, 1956 he completed ten years of service as director of the garden.

We are happy about the progress we have made in these 10 years and have visions of greater progress for the garden in the next 10 year period.

We also begin preparations for our Tenth Annual Cactus Show which will open on February 17th and run until February 24th inclusive and we hope to make it our best show.

W. H. Earle, who has done such a splendid job in the past years, will manage the show and his request for entries will be noted below.

We also have a schedule of classifications of the show in this issue so that you can plan your entries.

We have had to postpone the planned article on Epithelantha, the button cactus, to a later issue because we have run into technical difficulties which must be clarified. It will be run as soon as we are sure of our facts about these interesting small plants.

Meanwhile we have a picture book issue to introduce to you some of the personalities who comprise our Executive Board and Advisory Board. These are the friendly people who have made possible the development of our garden by their interest and advice. W.T.M.

It is always a pleasure to begin arrangements for another Cactus Show as I know the exhibitors will show and stage better plants than they exhibited the year before. Several of last year's exhibitors have already told me what plants they plan to enter this year and are now getting them ready for exhibition. The Show will open in just about six weeks and you should now be looking over your plants and selecting those you wish to enter.

Trophies will again be awarded to the winners in the various classifications. The rarest cactus and rarest succulents will each receive a trophy. They will be selected by the judges from the entire Show, of plants considered rare in the opinion of the judges.

At the board meeting John Eversole catches an informal picture of: — Left to right Mrs. William Eliot, Mrs. Chas. Gilliland and Mrs. Ed Burrall.

There has been a slight change in Section "B" in that 'Collection of over 5 plants of a genus - Cactus' has been changed to read 'Collection of 6 or more plants of a genus - Cactus'. Additional numbers from "B" 12 and upward will be added to the entry list as the various genera are added. For an example:- "B" 12 might be 'A collection of 6 or more plants of a genus - Rebutias', "B" 13 might be 'A collection of 6 or more plants of a genus - Parodias' and so forth.

There is very little I can tell you on how to get your plants ready for exhibition as each person has their own ideas and system. The important thing about showing your plants is to exhibit them in clean inconspicuous pots, have the plants clean, free of debris, bugs or infestation. W.H.E.

IDRIA COLUMNAR IS

The Boogum Tree

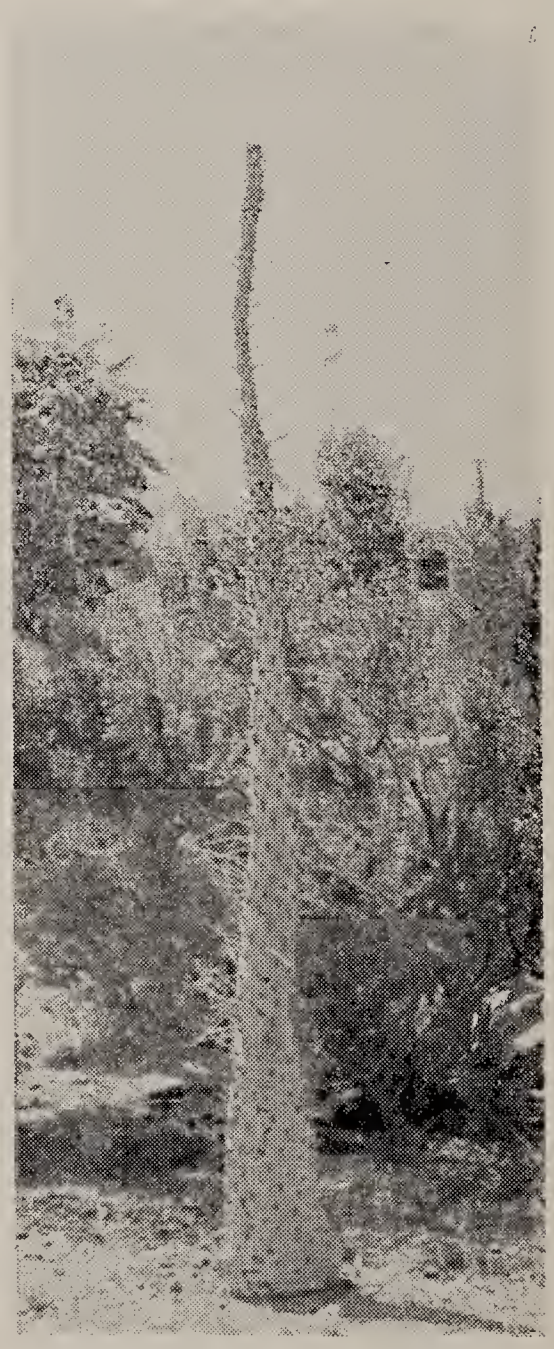
The boogum tree is a member of the Candlewood family of plants (Fouquieriaceae) and it is native to lower California, Mexico and one small colony of them is found along the coast of the Gulf of Lower California in Sonora, Mexico.

Quite different in appearance from the 7 or 8 other species of ocotillo this plant attracts a lot of attention from our visitors. We have 8 plants of various sizes on exhibition at various points in our garden one of which is illustrated.

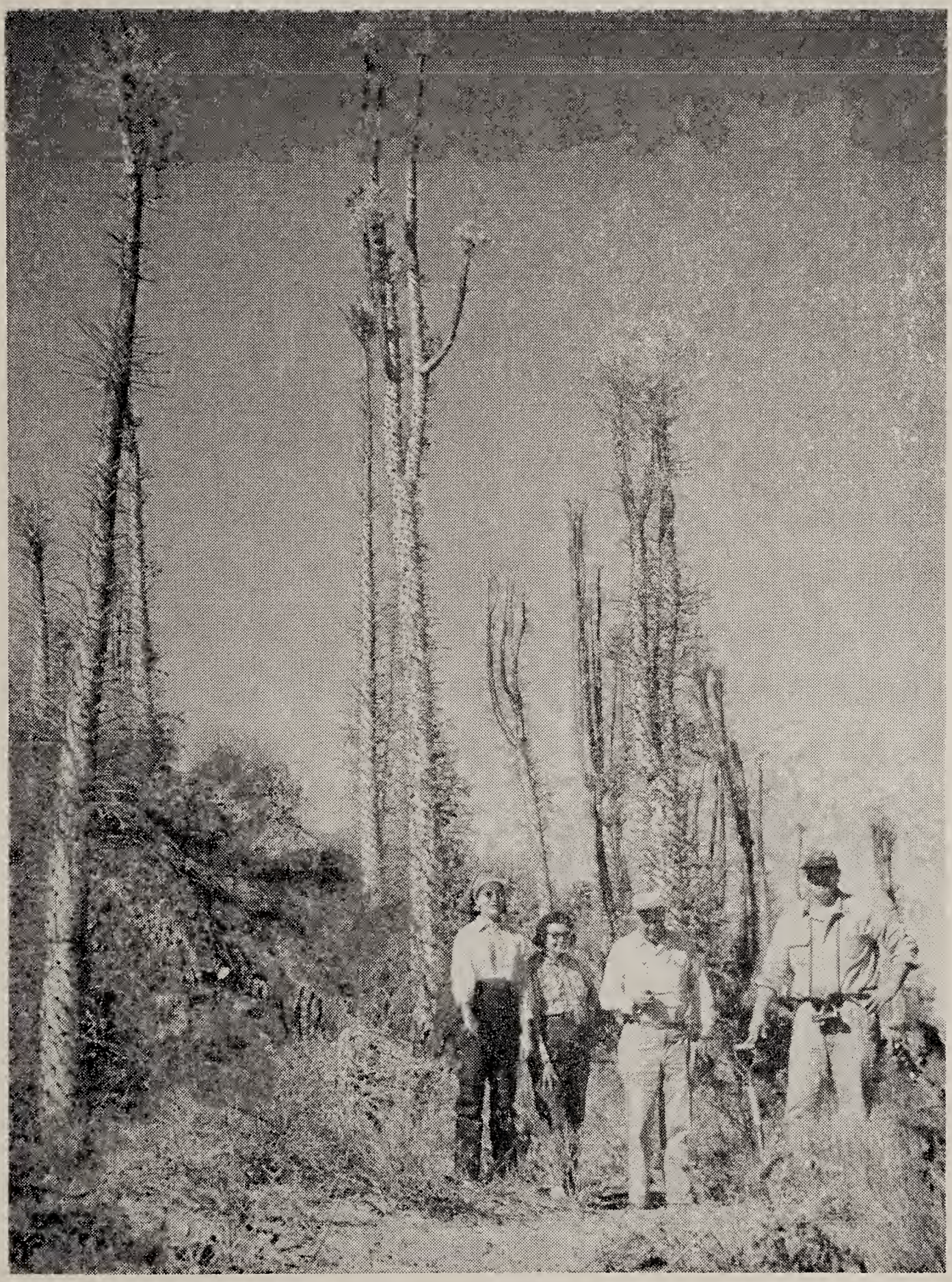
On a recent trip which Dr. George Lindsay conducted especially for the information of Dr. Helia Bravo H. into the Idria territory of Lower California the picture of the mature plants were photographed with some members of the expedition in the foreground.

Cactomaniacs Meet Tuesday,
January 8 — 8 P. M.
At Garden

No Notice Will Be Mailed.



Idria columaris in our garden
Photo by Robert F. Ames.



Idria columaris, the boogum tree, in Lower California. Left to right: — Mrs. Chas. Mieg, Dr. Helia Bravo H., Chas. Mieg and Dr. George Lindsay. — Photo by Dr. Lindsay.

TENTH ANNUAL CACTUS SHOW

February 17th to February 24th 1957

Sponsored by the Phoenix Gazette and the Desert Botanical Garden. Exhibits open to the public 12 noon Sunday, Feb. 17th, 1957 and daily to February 24th, 10 a.m. to 5 p.m.

NO ADMISSION CHARGE. W. H. Earle Show Manager.

Schedule of Classifications

SECTION "A" POTTED SPECIMEN PLANTS

1. One species of Cactus
2. Seeding Cactus
3. Grafted Cactus
4. Crested Cactus — own root
5. One species of a Succulent plant other than Cactus
6. Desert Trees or Shrubs. One species potted

SECTION "B" COLLECTIONS OF POTTED PLANTS

1. Cacti, at least five species
3. Desert Trees or Shrubs, at least five species
4. Cacti, ten species or more
5. Succulents, ten species or more
6. Collection of 5 plants of one genus — Cactus
7. Collection of 5 plants of one genus — Succulents
8. Collection of 6 or more plants of one genus — Succulents
9. Collection of 6 or more Cactus Grafts
10. Collection of 6 or more Chollas
11. Collection of 6 or more Prickly Pears
12. — ? A separate number will be assigned to a collection of 6 or more plants of a genus. Therefore any genus can be entered.

SECTION "C" DISH GARDENS (Accessories Permitted)

1. Dish garden 8" or less — Cactus
2. Dish garden 8" or less — Succulents
3. Dish garden 8" or less — Cactus & Succulents
4. Dish garden over 8½" — Cactus
5. Dish garden over 8½" — Succulents
6. Dish garden over 8½" — Cactus & Succulents
7. Miniature Cacti in containers
8. Strawberry Jar 14" tall or less

SECTION "D" ARRANGEMENTS WITH ACCESSORIES

1. Cacti for centerpiece
2. Succulents for centerpiece
3. Cacti and Succulents for centerpiece
4. Cacti with garden flowers as accessories
5. Succulents with garden flowers as accessories
6. Cacti, American Indian influence
7. Corsage of Succulents
8. Terrarium
9. Novelty container with Cacti
10. Novelty container with Succulents
11. Novelty container with Cacti and Succulents
12. Button Gardens
13. Arrangements with Dried Material
14. Miniature arrangements

SECTION "E"

1. Educational exhibits
2. Book exhibits
3. Water Colors — Oils — Pen & Ink
   Rarest Cactus — Rarest Succulent. Cup awards to be made by the judges from the whole show of plants considered rare in the opinion of the judges.

Entries can be placed in space assigned after 1 P.M. Saturday, February 16th or before 10 A.M. Sunday, February 17th. Exhibits can be removed Sunday, February 24th after 5 P.M. or on Monday, February 25th. For additional information telephone WH 5-8513.

PACHYCEREUS ORCUTTII

(K. Brandegee) Br. & R.

This least known species of arborescent cactus was first obtained by C. R. Orcutt of San Diego, California in May 1886 as described by Mrs. Brandegee in Zoe 5:3. 1900. Her account of the find is as follows:-

"The plant from which this description is drawn was obtained by Mr. C. R. Orcutt near Rosario, Baja California, in May, 1886. It was brought to him by his guide, who found it off the trail some little distance. The cutting was planted in Mr. Orcutt's garden, and is now about 2 m. in height; it has flow-

Details of the youngest branch of the plant of Pachycereus orcuttii in its habitat in Baja California, Mexico.
Photo by Dr. Lindsay.

ered but formed no fruit. It is much the finest of the large Cerei of Baja California, being densely covered with bright, yellowish brown spines. By its flowers it is obviously related to C. pringlei Wats. The guide told Mr. Orcutt that it bore in its season edible

Pachycereus orcuttii. One of only 2 plants of this rare species that have been found. Chas. Mieg is the inspector. Photo by Dr. Lindsay.

Another group at the board meeting Left to right: — Mrs. W. Hubert Earle, Reg. Manning, Mrs. John H. Eversole, Mrs. Mel Hinman and Mrs. Reg. Manning.

East Lily Cactus in flower in the Garden.
Moulton Smith photo.

fruit the size of an orange, but it is possible that he confused it with C. thurberi."

The plant and its flower were photographed by Orcutt at the time that Mrs. Brandegee made the description of it and a few copies of this early picture are still available.

From 1900 the plant was lost and no new collections were made despite intensive search by Howard E. Gates, George Lindsay and others on several expeditions.

During the Christmas holidays of 1949 Mr. Charles F. Harbison of San Diego on a hurried trip to Baja California described to Senora Anita G. Espinosa of El Rosario the plant and showed her a copy of the Orcutt photographs. Mrs. Espinosa consulted with her father-in-law who thought he remembered seeing two plants similar to that photographed on a trip he made many years before. Mrs. Espinosa arranged to conduct a search for the plants and the following February notified Mr. Harbison by mail of her success in locating the two plants.

Later Mr. Harbison and some friends returned to El Rosario and were shown the plants from which three cuttings were taken and they photographed dried fruits and collected a few seeds from them.

One cutting was sent to the Huntington Botanical Garden, one to George Lindsay who sent it to us and the third retained by Mr. Harbison.

The cutting sent to us was infested with plant borers on its arrival and despite careful surgery did not survive.

The seeds collected were grown by Howard E. Gates and he presented a 6 inch seedling to us in April, 1953 which is now about 29 inches tall and a very handsome plant.

As only two plants have ever been found in the habitat and only a few seeds were obtained and germinated we feel that this is one of the rarest of all species of cactus.

Mrs. Lou Ella Archer converses with the gargoyle at a recent Board Meeting. — Photo by John Eversole.

W. Hubert Earle explains a plant to visitors.
Moulton Smith photo.

Left to right: — Mrs. Chas. Mieg and Dr. Helia Bravo H.

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Pachycereus (?) gaumeri

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EDITORIAL

February is the month of our Annual Cactus Show which is sponsored by the Garden and the Phoenix Gazette. The tenth of these shows is scheduled to open on Sunday, February 17th at noon and to be open every day until Sunday, February 24th, when it will close at 4:45 P.M.

Following the usual custom we expect this show to be larger and better than any previous one. We should have more exhibits and finer plants than ever before and it will certainly be educational to the general public who are invited to visit it without charge.

As usual we will have to depend on our membership for volunteer help in handling the large crowds the show always attracts. We need assistance in the building to watch the exhibits to prevent handling of plants and petit theft. We need additional guards and guides along the paths in the garden and we need help at the sales tables.

As is also customary we will have lunches for the good people who help us, each noon.

An attempt will be made at the coming session of the State Legislature to amend the Native Plant Protection Law so as to make in enforcible and at the same time reasonable.

The law as of now is too inclusive as it protects many weeds and the cholla and prickly pear cactus which certainly need no protection and actually makes it a violation punishable by a fine not in excess of $300 to weed the highway shoulder in front of your home.

Under the new proposal only the plants that are really in danger of extinction would be protected on public lands, but an Arizona resident could collect native plants from private lands for use in their own garden by getting written permission from the owner of the property.

Revision of our Native Plant Law is sorely needed.

BOOK REVIEW

Desert Drama — Iona Hiser — Abelard-Schuman, N. Y. 1956. 160 pages — cloth bound, $3.00.

In 1947 Wm. H. Carr wrote Desert Parade which was an attempt to cover the plants, animals, reptiles, lizards and birds of the deserts of our great southwest in 96 well written pages with excellent photographs by Marvin H. Frost. It never became a big seller because the coverage of each subject was too thin.

Mrs. Hiser has now attempted the same coverage of subjects in a manner similar to Carr's work, but insofar as the plant coverage is concerned with very considerable inaccuracy.

In the blurb on the dust cover it is stated that the manuscript of Mrs. Hiser's book was carefully checked by Dr. Wm. H. Carr of the Arizona-Sonora Desert Museum and therefore the information on Animal life may the accurate. The writer is not an authority on that subject.

In the plant coverage we note 27 inaccuracies in the first 13 pages of text in the Hiser book which leads us to wonder why an author attempts to write on a subject with which she is obviously not well acquainted, or if she must do so, why a check is not made for facts with some acknowledged authority.

Not recommended to seekers after factual information on plants.

THE BARREL CACTUSES

In the Cactus family there is a large sub-tribe designated as Echinocactanae in which we find plants which are globe-shaped to short cylindrical and bear their flowers from the upper part of the plant and from the same areoles, or enlarged pores, which bear the spines.

At one time all of the species in this sub-tribe belonged to the genus Echinocactus but, because of the great variation in flower and fruit characters, they were broken into a number of smaller genera by Britton & Rose in 1922 in the third volume of Cactaceae.

Many of the globe-shaped, rather large species in this sub-tribe have the common name of barrel cactus because of their shape and size, and this leads to confusion which could be clarified by calling each by a particular name. As an example the common barrel cactus of the California, Nevada and central Arizona deserts is Ferocactus acanthodes which could be called the California barrel cactus.

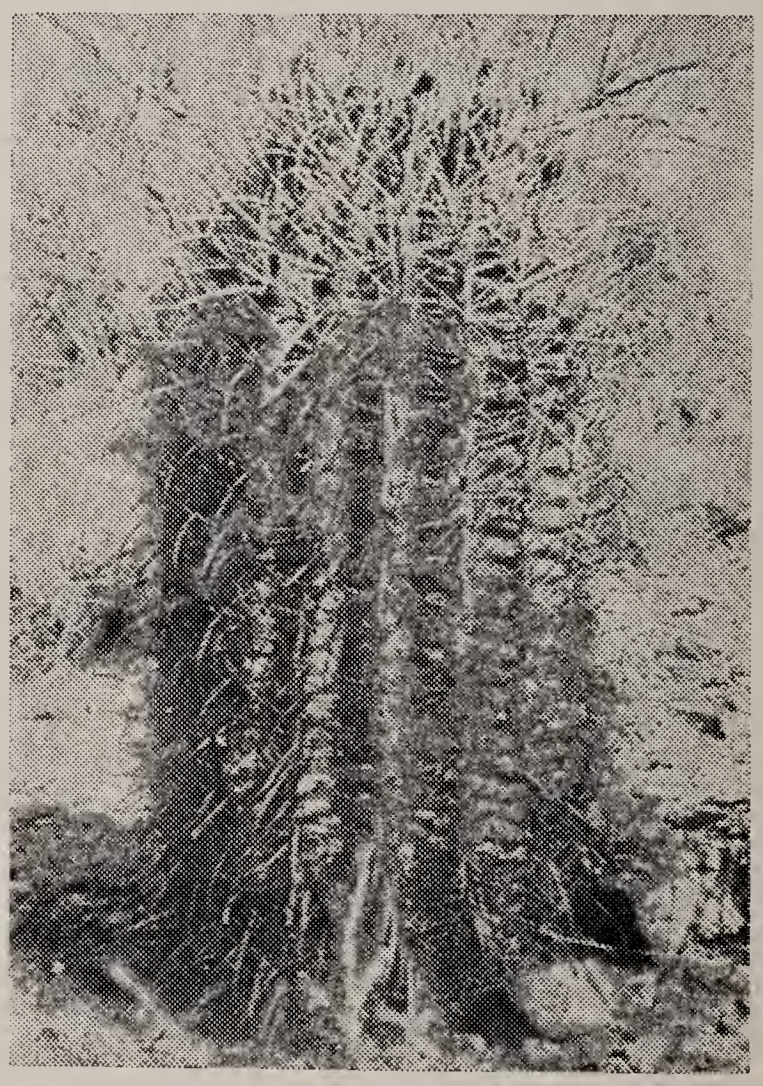
The barrel name usually is applied to species of cactus from North America but sometimes a few of the South Americans also are called barrels. For example Gymnocalycium saglione when it attains its maximum size is referred to as a barrel. The number of plants from South America in this country which have attained a size to justify the name "barrel" is small, however, and can be disregarded at this time.

Of the North American species common in collections in the United States it will be noted that there is a very considerable difference in flower size and structure and in their fruits which necessitated the erection of several genera by Brittons & Rose to adequately explain them.

The North American barrels are found principally in four genera; Echinocactus, Ferocactus, Sclerocactus and Hamatocactus and these genera may be identified by the following characteristics:

1. Plants usually large and globose but sometimes small globose or clustered to form mounds. Spines usually robust. Apex of plants woolly, as are also the fruits. Flowers bell-shaped, of medium size, the flower tube bearing prickly scales and the ovary scaly with heavy wool in the scale axils. The fruit covered with wool, thin walled, nearly dry. Echinocactus.

2. Plants large, usually globose to cylindrical but sometimes smaller and disc like, or clustered into large mounds. Spines straight, curved or hooked, strong and usually annulate. Top of plant not densely wooly but the upper areoles bearing felt. Flowers usually large, bell-shaped with a very short tube. Ovary and tube very scaly, the scales not prickly and without wool.



California Barrel Cactus

Wislizenius' Barrel Cactus

Fruit yellow to brownish with broad scales, thick walled, the scale axils naked. Ferocactus.

3. Usually simple, globe-shaped to cylindrical plants of firm texture. Some of the spines hooked. Flowers bell-shaped. Ovary bearing thin scales with a tuff of short wool in their axils. Fruit nearly naked, rather juicy, usually red. Sclerocactus.

4. Usually simple but sometimes clustered, globe-shaped to cylindrical, medium to large and of flabby texture. Some of the spines hooked. Flower funnel-form, rather large, with narrow tube and expanded throat. Scales on ovary few, naked in their axils. Fruit relatively small, globe-shaped, red, with few, naked scales. All species flower easily and frequently. Hamatocactus.

The United States flora includes four species of the genus Ferocactus, two Echinocacti, 2 or 3 Sclerocacti and two species of Hamatocactus or about 11 plants usually classified as barrel cactuses.

We consider Ferocactus first because 3 of the 4 native species are very commonly found in collections. It is quite easy to recognize the separate species at any time but especially when they are small.

Ferocactus acanthodes which we shall call the California Barrel Cactus is completely globe-shaped when young with continuous ribs and a heavy armament of spines of which 4 or more are central and the remainder needle-like and spreading and at maturity some additional bristley spines are developed. The central spines are flattened, curved but not hooked, annulate and may be red, pink, white or gray becoming black at the base of old plants. In age this species becomes cylinder-shaped and from 3 to 7 feet tall and 1 foot in diameter.

The relatively small pale yellow to

greenish flowers are borne in a complete circle at the top of the plants in April and frequently again in late August. It comes from California, Nevada and Arizona.

Dr. George Lindsay, in his revision of the genus Ferocactus has retained as a variety of the California Barrel the entity published by Dr. George Engelmann in 1856 as Echinocactus lecontei.

Dr. Lindsay says that Ferocactus acanthodes var. lecontei occupies the northern and eastern portions of the range of F. acanthodes and it is the variety found in Arizona. It differs from true F. acanthodes in "having more appressed spines, a more clavate body and smaller seeds." Dr. Lindsay adds* "It is indeed difficult or probably impossible to draw a distinct line between var. acanthodes and var. lecontei. The divergent characters which appear to be constant in some populations blend in others."

Ferocactus wizlizenii or Wislizenius' Barrel Cactus is a native to Arizona, New Mexico and Texas as well as northern Mexico and in youth it is disc-shaped and not so heavily armed as the California barrel. The central spines are flattened, annulate and one of them is usually strongly hooked. The radial spines in juvenile plants are all white and bristle-like. In age the plant is globe-shaped to short cylindrical and up to about 2 feet high in the United States range but it may be 4 or 5 feet tall in the State of Sonora.

Flowers are borne in August and September, sometimes in late July and are relatively large and range from yellow to red.

Ferocactus covillei "Coville's barrel cactus," is found in the United States only in or near the Papago Indian Reservation where it attains a size comparable to Wislizenius' Barrel but in Sonora it may attain to 8 feet in height.

The juvenile plant is unmistakable having only 4 to 6 ribs made up of large, nipple like projections with the cluster of heavy annulate spines, one of which is strongly hooked, atop each nipple. There are no bristle-like spines at this age.

In maturity it more closely resembles a mature Wislizenius' Barrel but always

Coville's Barrel Cactus

Front: California Barrel Cactus.
Rear: Two hybrid forms found in one colony of the California Barrel.

lacks the bristle-like spines of that species.

It flowers in late August, September and October and the large flower has yellow petals with a red mid stripe.

Ferocactus viridescens is found only in the coastal area of San Diego County in California and in Baja California, Mexico. The green flowered barrel cactus is a small, disc-shaped plant up to 6 or 7 inches in diameter and 1 or 2 or possibly 4 inches high and in season bears small, greenish flowers.

A few exceptions to the above separations should be noted in that the California Barrel sometimes forms clusters of stems (up to 15) in certain areas of the Mojave Desert of California and it hybridizes with Wislizenius Barrel at several points notably in the McDowell Mountains and other areas of central Arizona.

A monstrose form of either the California Barrel or Wislezenius Barrel Cactus is found near Wickenburg and Congress Junction in which the ribs are broken up into irregular rows of areoles. This form was named Ferocactus hertrichii with no justification.

Cristate forms of both the California and Wislizenius barrels are fairly common in Arizona and of Wislizenius Barrel in Texas.

This information should enable you to identify and classify the United States species of Ferocactus but further confusion might occur in the rare garden where some of the 24 or more Mexican species of the genus are cultivated. The Mexican species and their popular names are listed on page 21.

Echinocactus horizonthalonius is the commonest species of that genus in the United States ranging from south central Arizona through New Mexico to Texas and south into Mexico. We have always called it the flat barrel or small barrel.

In much of its range it is more or less disc-shaped but in other areas, notably Arizona it is nearly globose. It has 7 to 13 broad ribs which show clearly through the spines, disclosing a bluish color in the plant body. 6 to 8 spines,

straight or curved (never hooked) more or less flattened and annulate are reddish or somewhat blackened at the base and spread widely. The apex of the plant is white woolly.

The rose colored flower is quite large and appears in mid-summer in Arizona. The fruit is densely woolly.

Echinocactus polcephalus, the many headed barrel, is native to Mojave Desert in California and at Navajo Bridge and in Yuma County in Arizona.

Individual heads are globe-shaped or short cylindrical but form mounds of 30 or more heads. Ribs 13 to 21, Spines 7 to 15 of which 4 are central and stouter than the radials, curved but not hooked, red to yellow and sometimes as much as 4 inches long. The flowers from the woolly top of the plants are yellow and the fruit is covered with dense wool.

The plants from Navajo Bridge, Kaibab Plateau, Utah and Lees Ferry have been referred to variety xeranthemoides in which the seeds are shining black while in the variety polycephalus the seeds are dull black.

All of the other species in the genus Echinocactus are from Mexico but two of them, Echinocactus grusonii, the golden barrel, and E. platyacanthus, the striped barrel, are found in many collections.

Later we will discuss the genera Sclerocactus and Hamatocactus after these genera have been considered on the program of the Cactomaniacs as the genera Ferocactus and Echinocactus were considered by the January meeting of the Cactomaniacs.

Many headed barrel cactus.

Three species of Barrel Cactus:
Left, Coville's; Front, California, and Rear, Wislizenius' Barrels.

Mexican Ferocacti and Their Popular Names

F. Santa maria, (F. townsendianus var. santa maria) Magdalena Island Barrel.

F. townsendianus — Southern Baja Ca ifornia — Townsend's barrel.

F. diguetii — Carmen Island — Largest Barrel.

F. johnsonii — Johnson's barrel.

F. peninsulae — and var. viscainensis — Viscain barrel.

F. rectispinus — Central Baja California — Hat Pin Barrel.

R. robustus — Tehuacan — Mounded barrel.

E. echidne — Hidalgo — Clustered barrel.

F. alamosanus, Sonora and Silaloa — Alamos barrel.

F. glaucesens — Eastern Central Mexico — Bluish Barrel.

F. flavovirens — Tehuacan — Yellow-green barrel.

F. melocactiformis (F. electacanthus) properly F. histrix — Eastern Mexico.

F. macrodiscus — San Luis Potosi — Disc barrel.

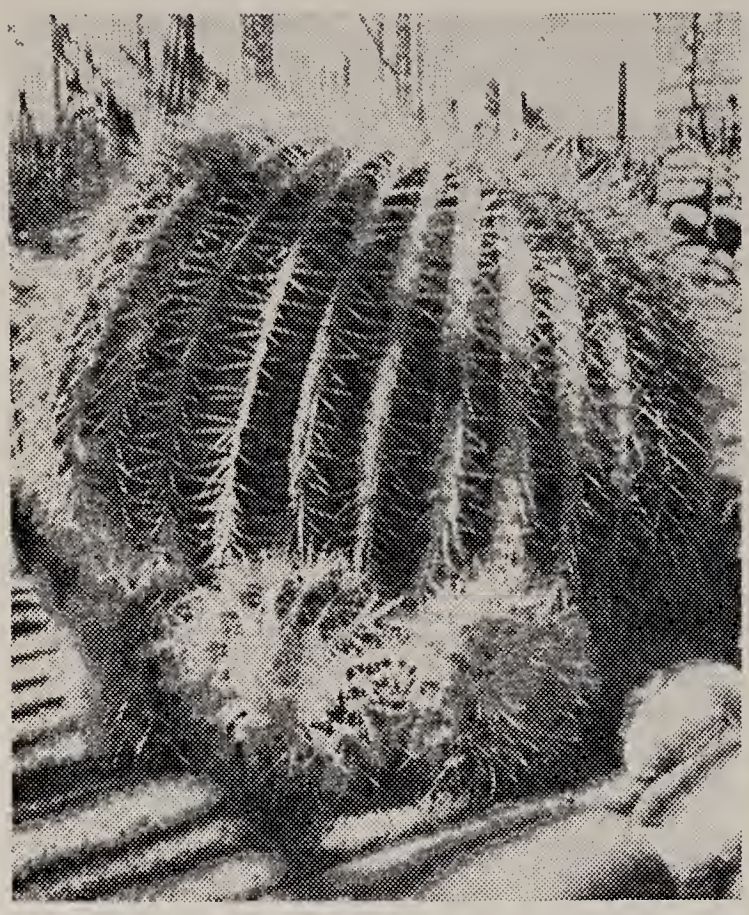
F. nobilis (properly F. recurvus) — Noble barrel.

F. latispinus — Widely distributed in Mexico — Flat spined barrel. White, yellow and magenta flowers are found in F. latispinus.

F. gracilis & var. coloratus — Baja Calif. — Red barrel.

F. pilosus (F. pringlei) (F. stainestii) — Flame barrel.

CACTOMANIACS MEET FEBRUARY 5th — 8 P. M.
Barrell Cactus continued as subject.
Bill Rand Conducting.



Golden Barrel Striped Barrel
Moulton Smith Photos.

PACHYCEREUS (?) GAUMERI Br. & P.

In January of 1936 the late Howard Bullard presented to the writer a cutting from a plant of Pachycereus gaumeri that Mr. Bullard had purchased from the Poindexter Nursery at Compton who had received it from Yucatan.

My cutting was about 6 inches long with three ribs or wings and the margins of the ribs bore small Areoles with 3 to 6 small but robust spines.

For twenty one years the cutting has grown, first in my garden in Highland Park, California, and for the last ten years in the Desert Botanical Garden where we keep it in our lath house.

After 21 years the parent plant is about three feet high and it now has two branches but has made more which were removed and given to other Botanical Gardens.

It is a slow growing plant but a most interesting one and one that occupies an uncertain position as to its classification.

The species was first collected by George F. Gaumer in 1894 who found only two plants at the Port of Silam, Yucatan, and sent cuttings to Dr. Millspaugh who apparently did nothing with it.

In 1917 Mr. Gaumer again collected the species at Hodo, Yucatan and sent many fine specimens of flowers and several cross sections of a plant to Dr. Millspaugh who gave them to Drs. Britton and Rose for description.

Britton and Rose described these plants in Volume 2 of Cactaceae 1920 and added the description of another plant, also from Gaumer, and finally in Volume 4 of Cactaceae described the fruit which Gaumer sent them in 1922.

The composite descriptions present a plant up to 20 feet tall with but few branches and 3 to 7 thin, high ribs or wings which bear areoles with brown felt and a few to 15 spines which are quite short on our specimen but are sometimes nearly an inch long.

The flowers are a light green tinged with cream color, quite showy but not large (2 inches) and they do not open

Pachycereus (?) gaumeri

widely. The ovary and flower tube bear leaf-like scales which dry black and thin and have brown felt in their axils. Fruit globe-shaped, small, 1 or 2 inches, the scales at the base small but becoming long and leaf-like above, fleshy at base but thin at tips and soon drying black. The axils of these scales bear felt and a cluster of about 8 very short, black spines.

Britton and Rose placed this species in Pachycereus because the flowers more nearly resembled the flowers in that genus but questioned the placement even as they made it.

Backeberg erected a new genus Anisocereus in 1938 for Cereus lepidanthus Eichlam a species from Guatemala which Br. & Rose had also referred to Pachycereus. Later Backeberg placed Pachycereus gaumeri Br. & R. in the genus Anisocereus which would seem reasonable and proper.

However in 1954 MacDougall and Miranda erected a new genus Pterocereus with a newly discovered species Pterocereus foetidus as the type and the generic description is so near to Anisocereus that it seems unnecessary to consider Pterocereus other than a synonym of Anisocereus. Additional research is needed however before a certain decision can be attempted.

By any name our plant is very attractive as is partly indicated by pictures of the apex of our parent plant and of the two branches currently growing on it.

THE CACTUS

The cactus is nature's supreme pattern of patient endurance, and bold seizing of the moment to turn adversity to triumph. No depression ever makes it yield an inch. It can stand years of drought under the desert sun, holding all it has, but making no false moves, while it waits quietly for the rain that will give it a chance. When, at long last, the moisture comes, the plant leaps into activity. The stoic becomes an athlete of perfect efficiency. In the brief period before the dampness has dried away, the cactus has made its growth, put out its flowers, perfected its fruit, and stored up the reserves of water to last it through another decade or so of drought. What power it has

developed to husband its own resources! It has elaborated an impervious rind, which gives up no moisture to the sun, and has armed itself with spears to ward off enemies that might make a breach in its waterproof coat. Few plants are more interesting than these denizens of the desert, so marvelously adapted for their situation, and for all their forbidding aspect, so prompt to answer the kindness of a shower with a smile of beauteous bloom.

—"San Francisco Chronicle."
Printed about 20 years ago.

The flat barrel cactus.
R. C. Proctor Photo from Arizona's Cactuses.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

MARCH, 1957

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

Volume 11 MARCH, 1957 No. 3

Arizona Cactus and Native Flora Society

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Desert Botanical Garden of Arizona

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August Hermann, Sylvia Hermann

Garden open every day except Monday, from 10 A.M. to 4:45 P.M.
No charge for admission.

Cactomaniacs will meet on Tuesday evening, March 5th at 8 p.m. in Webster Auditorium.

The subject for discussion will be the genus Echinomastus, hedgehog breast cactuses, under the leadership of the Hermanns. Kodachromes will be shown. Prizes for best Echinomastus shown at the meeting by a member.

Anyone interested may attend the meeting.

EDITORIAL

Because we will be devoting all of our attention to the 10th Annual Cactus Show this issue of our Bulletin must be in the printers hands by early February and this copy is written on February 10th. No report on the Show can be made in this issue but it will be covered in the April Bulletin.

Under our By-laws the President has appointed a nominating committee to suggest the list of candidates to be voted on in the annual election on April 21st, which is Easter.

The committee consists of members who are familiar with the personnel of the Executive Board and can make good selections.

The ballots will be included with this issue of the Bulletin and should be returned to us at Tempe not later than April 18th to be counted in the election.

You vote for 2 members, either the nominating committee's choice as printed or any other member by writing his name into the blank space provided and marking an X opposite your choice.

The Executive Board and the expiration dates for its members are as follows:

Elected until 1958: J. H. Eversole, T. A. Goodnight, Mel Hinman.

Elected until 1959: Mrs. Lou Ella Archer, Mrs. Angela Bool, Wm. Eliot.

Elected until 1960: Reg Manning, W. Taylor Marshall, Chas. Mieg.

Expiring in 1957: J. H. Rhuart, Edward Burrall.

A final class in "Appreciation of Desert Plants" will commence on Wednesday afternoon, March 6th, at 3:30 P. M., and will continue for 5 successive Wednesdays.

The first two classes for this season have proved very successful and we have decided on this third class because of many requests.

Anyone may attend one or more of the lectures without charge but to those who attend at least 4 of them a certificate of completion of the study will be given.

In it the method of survival of vegetation in arid areas is explained and the use of desert plants in home landscaping in Arizona is accented and the methods of cultivation are illustrated.

MORE ABOUT THE BARREL CACTUSES

By WM. RAND

The plants considered at the February meeting of the Cactomaniacs, under the leadership of William Rand, were in the genera Sclerocactus and Hamatocactus which come under the common name heading of Barrel Cactuses.

They were keyed in the first article on Barrel Cactus in the February Bulletin.

The genus Sclerocactus was erected by Britton & Rose in Cactaceae, Vol. 3, page 212, and they described the genus as having in it simple or sometimes clustered plants with prominent ribs which are more or less undulate; spines well developed and some of them hooked; flowers from young areoles, above and adjacent to the spine-cluster, sub bell-shaped, purplish; the ovary oblong and bearing a few thin scales, each with a tuft of short wool in the axis; fruit oblong to pear-shaped, nearly naked, opening to release its seeds by a basal pore.

They state that the generic name is from the Greek word sclero — meaning hard, cruel, obstinate, referring to the formidable hooked spines which hold on in a most aggravating manner.

Two species were described S. polyancistrus which is designated as the type of the genus and S. whipplei.

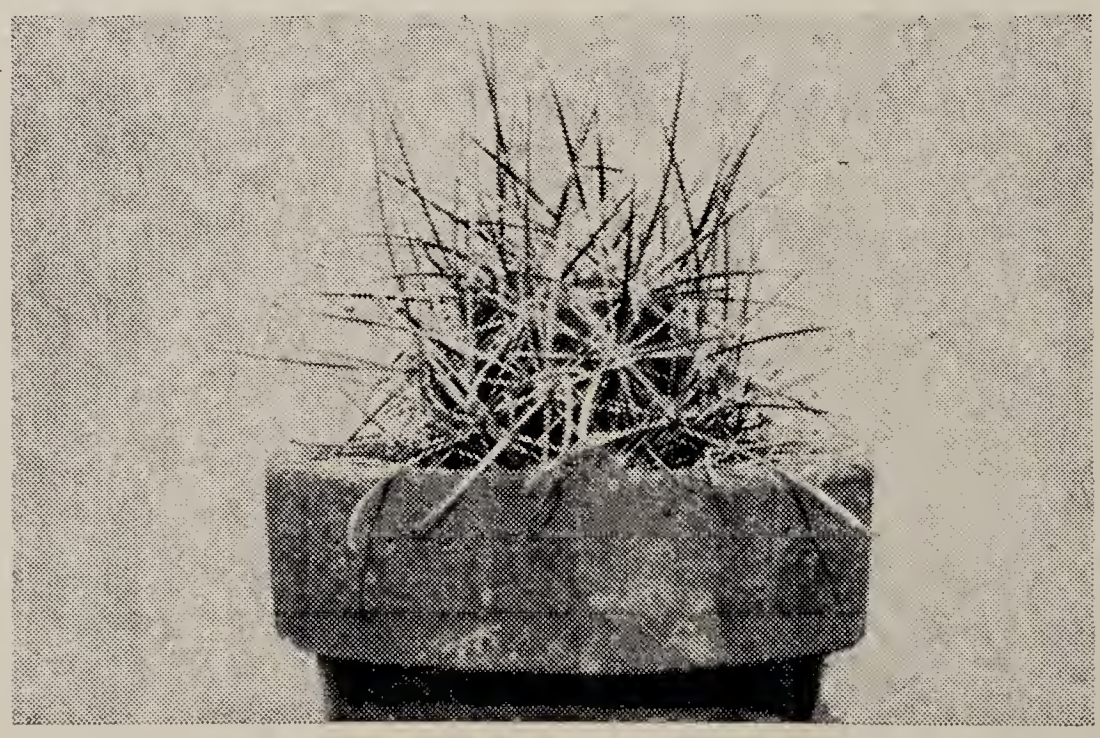
Further acquaintance with the plants show that the purplish colored flowers are not constant in S. whipplei, at least, as we have collected plants with both white and yellow flowers in Monument Valley in Utah and with kelly-green flowers in Canyon de Chelly in Arizona.

The flower size varies greatly, even in species, from less than 1 inch in length and diameter to 3 inches.

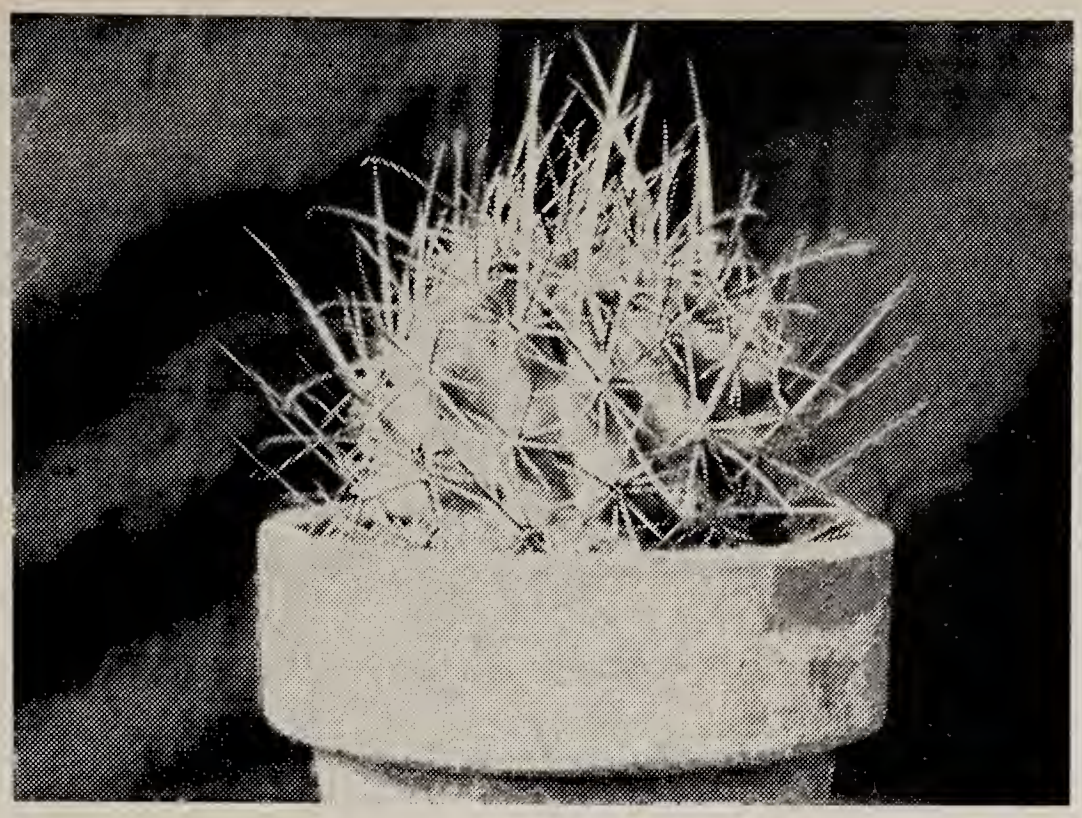
S. whipplei has a very wide range but usually at altitudes of from 4,000 feet to 8,000 feet in Arizona, Utah, New Mexico and Colorado.

In richer valley soil it attains to 8 or 10 inches in height or more while on steep hillsides in poorer soil it may be biscuit-shaped and less than 2 inches in height.

In the Utah desert near Provo specimens of what we though to be Coloradoa mesae-verdae, because they ex-



Sclerocactus whipplei var intermedius (Peebles)
This variety becomes cylindrical up to 12 inches high



Sclerocactus whipplei, a form from Monument Valley. The flower is large and light greenish-yellow.

actly resembled that plant in form and had only an occasional hooked spine, were collected by Prof. Blocher in 1954. When they flowered and fruited in our garden this proved to be just another form of S. whipplei with fairly large purplish flowers but the fruit had a few scales and dehisced by a basal pore.

Another plant sent to us for identification by Mrs. Nancy Duck from Grand Junction, Colorado in 1955 had only straight spines and was rather cylindrical in shape, the spines dense.

Still another form of this complicated species was collected in the Hopi Indian Reservation by a Garden expedition as a possible Mammillaria. It was disc-shaped, the flat top covered with numerous tubercles or nipples and only a few straight, short spines on each nipple. After three years in our Garden this became a typical S. whipplei complete with hooked spines and purplish flowers.

The green flowered specimens from Canyon de Chelly were collected by George Lindsay and two of them were given by him to us.

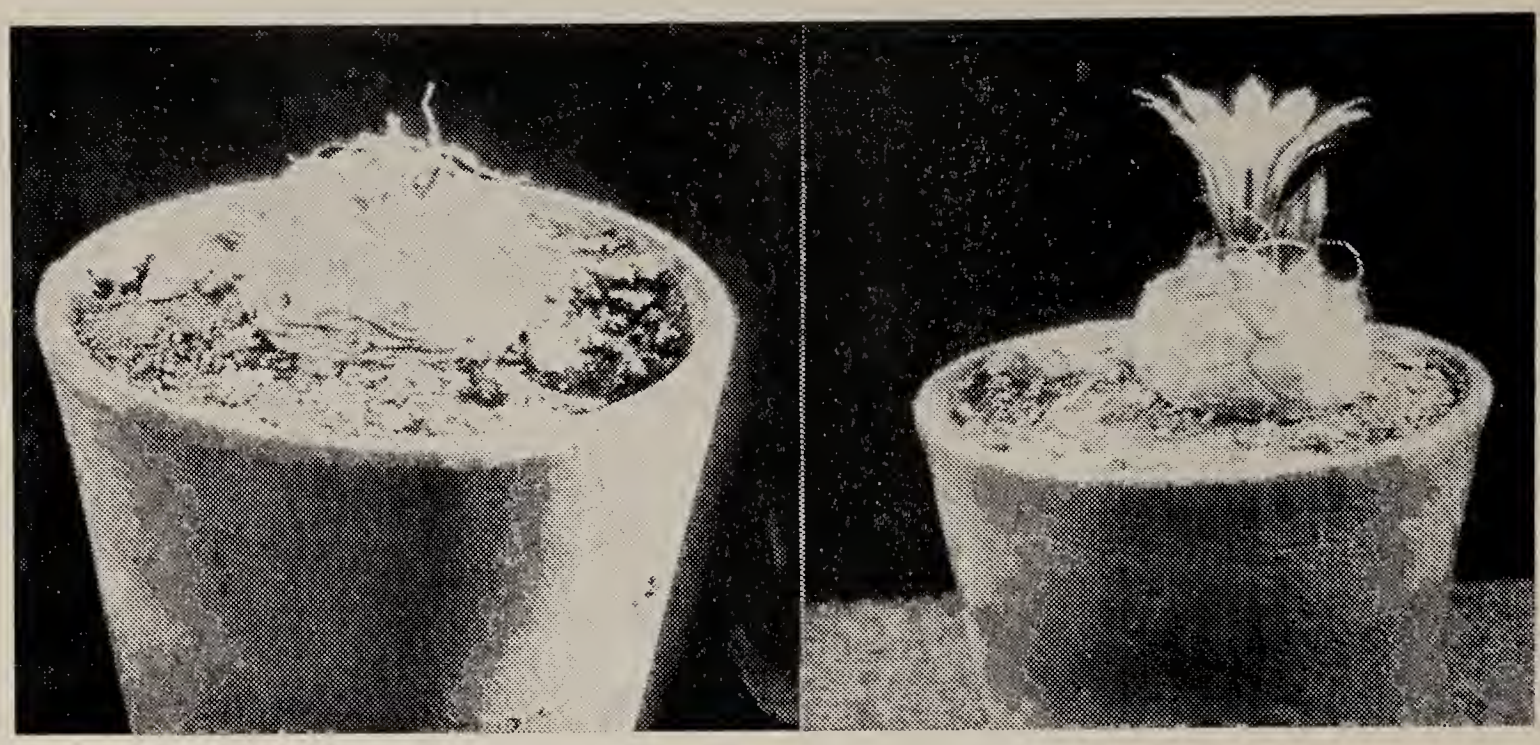
Dr. Elzada U. Clover of the University of Michigan collected forms of this species along the walls of the Grand Canyon on her boat trip down through the Canyon in about 1940. She later described two species, Sclerocactus parviflorus Clover & Jotter and Sclerocactus havasupaiensis Clover and to this last species she assigned a variety Sclerocactus havasupaiensis Clover var. roseus Clover.

Peebles published Sclerocactus intermedius for the columnar variation that occurs near Pipe Springs and Sclerocactus whipplei variety pygmaeus Peebles, a smaller form from Apache County.

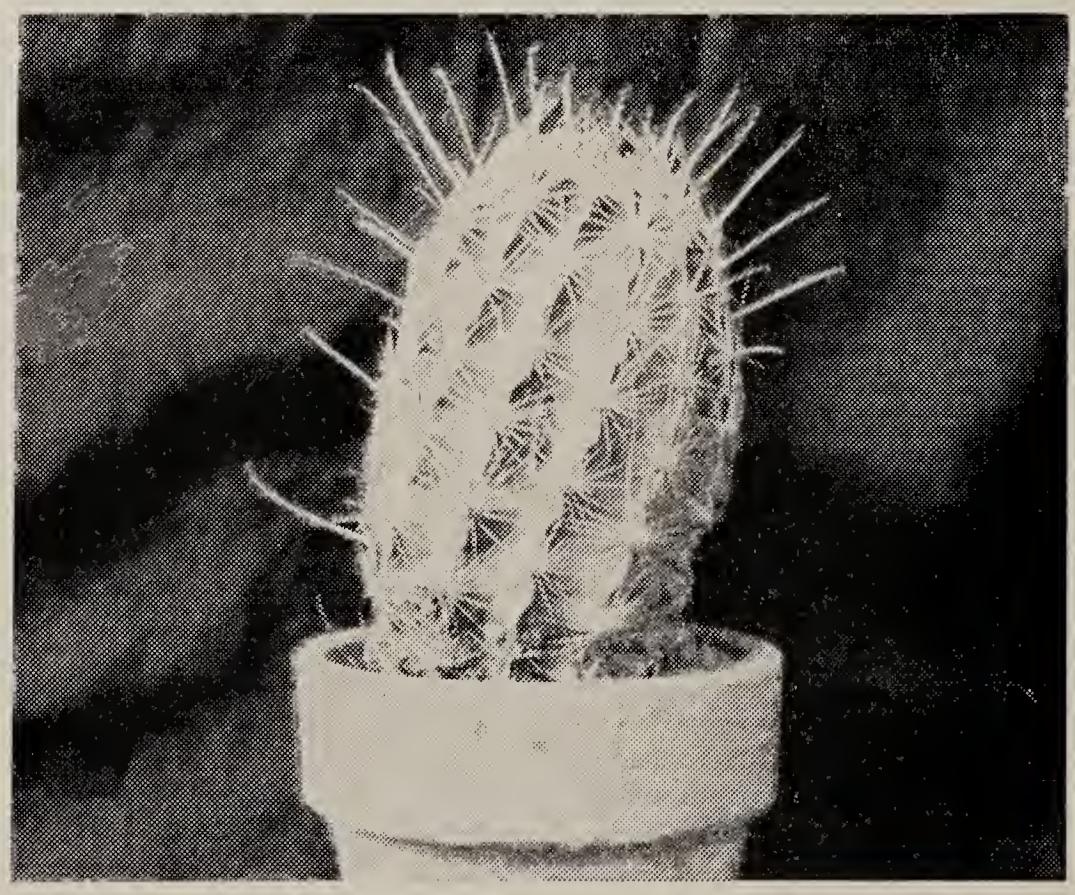
Evans described Sclerocactus franklinii for a variation from Colorado.

Perhaps the best understanding of Sclerocactus whipplei would result from a description of the species with notes on its varieties which we will publish in a separate article.

Sclerocactus polyancistrus is native to California and is a plant of remarkable beauty but very rare in comparatively limited area of its habitat which is from Helendale, near Barstow on the Mojave Desert, the type locality and northward following the Panamint range to Westgard Pass.



Toumeya schwarzii (Shurly) Bravo & Marshall
2 illustrations of the type plant, courtesy of Mr. Shurly



Hamatocactus setispinus (Engel.) Br. & R. var setaceus (Engel.)
The more familiar form of this popular species.

THE GENUS TOUMEYA

DR. HELIA BRAVO HOLLIS and W. TAYLOR MARSHALL

In the December 1956 Saguaroland Bulletin we published a revision of the genus Toumeya in which we listed as perhaps of this genus Turbinicarpus schwarzii (Shurly) Backeberg.

Backeberg included it in his summary of the genus Turbinicarpus in Cactus & Succlent Journal of America XXIII:150, 1951, without citation of original publication but a letter to E. Shurly, the editor of Cact. & Succ. Journ., Great Britain, resulted in a copy of that Journal for October 1948 wherein Mr. Shurly had published Strombocactus schwarzii. The picture of the plant as illustrated in that publication is reproduced herewith through permission of Mr. Shurly as the only known photograph of the species.

Toumeya schwarzii (Shurly) Bravo & Marshall comb. nov.
Strombocactus schwarzii Shurly, Cact. & Succ. Jour. of Great Britain 10:4:93. 1948.
Turbinicarpus schwarzii Backeberg Cact. & Succ. Journ. of America XXIII:150. 1951. Reference only.

Plant simple, turbinate, apex flattened, pale green, with minute dots of short white hairs; tubercles flattened, 4 angled, in 5-8 spirals; areoles oval, the nascent ones with long white, silky hairs but soon naked; spines 1 or 2 in the upper areoles, yellowish-brown, whitish or horn-colored, when 2 the lower one 4-5 mm. long, the upper one 20 mm. long.

Flowers usually in pairs from the apex of the plant, rotate-campanulate, white, 3 cm. long, 4 cm. wide; filaments pale purple above, anthers orange; style pale purple; stigma lobes 5-6, long, narrow linear, spreading, white, pubescent.

Type locality: — Not given.

Distribution: — Reported from the eastern part of San Luis Potosi, Mex.

Discovered by Fritz Schwarz who reports the plant grows in heavy, black earth mostly under shrubs. The largest specimens collected about 4 cm. in diameter.

Planta simple, turbinada, apice aplanado, color verde palido, provista de minusculas motitas de pelos blancos, cortos; tuberculos aplanados con 4 angulos, en 5-8 series espiraladas; areolas ovales, las nacientes con pelos largos, blancos y sedosos, pronto desnudas; espinos 1 o 2, solamente en las areolas superiores, cafe amarillentas, blanquecinas o color de cuerno, cuando hay 2. la inferior es de 4-5 mm. de longitud y la superior de 20 mm. de longitud.

Flores generalmente en pares, en el apice de la planta, corola rotada-campanulada, blanca, 3 cm. de longitud y 4 cm. de ancho; filamentos purpura claro arriba; anteras anaranjadas; estilo purpura claro arriba; lobulos del estigma 5-6, lineares, extendidos, blancos pubescentes.

Localidad tipo: No conocida.

Distribucion: Reportada al este de San Luis Potosi, Mex.

Ha sido reportada por F. Schwarts creciendo abajo de arbustos pequenos en titrra negra. Los ejemplares mas grandes que se han colectado miden como 4 cm. de diametro.

MORE ABOUT BARRELS

It was reported from Houserock Valley in Arizona but never recollected there although extensively hunted. Our Hubert Earle brought from Houserock Valley a variety of S. whipplei that closely resembled S. polyancistrus.

Dr. Clover reports S. polyancistrus from the Grand Canyon at Mile Rapid.

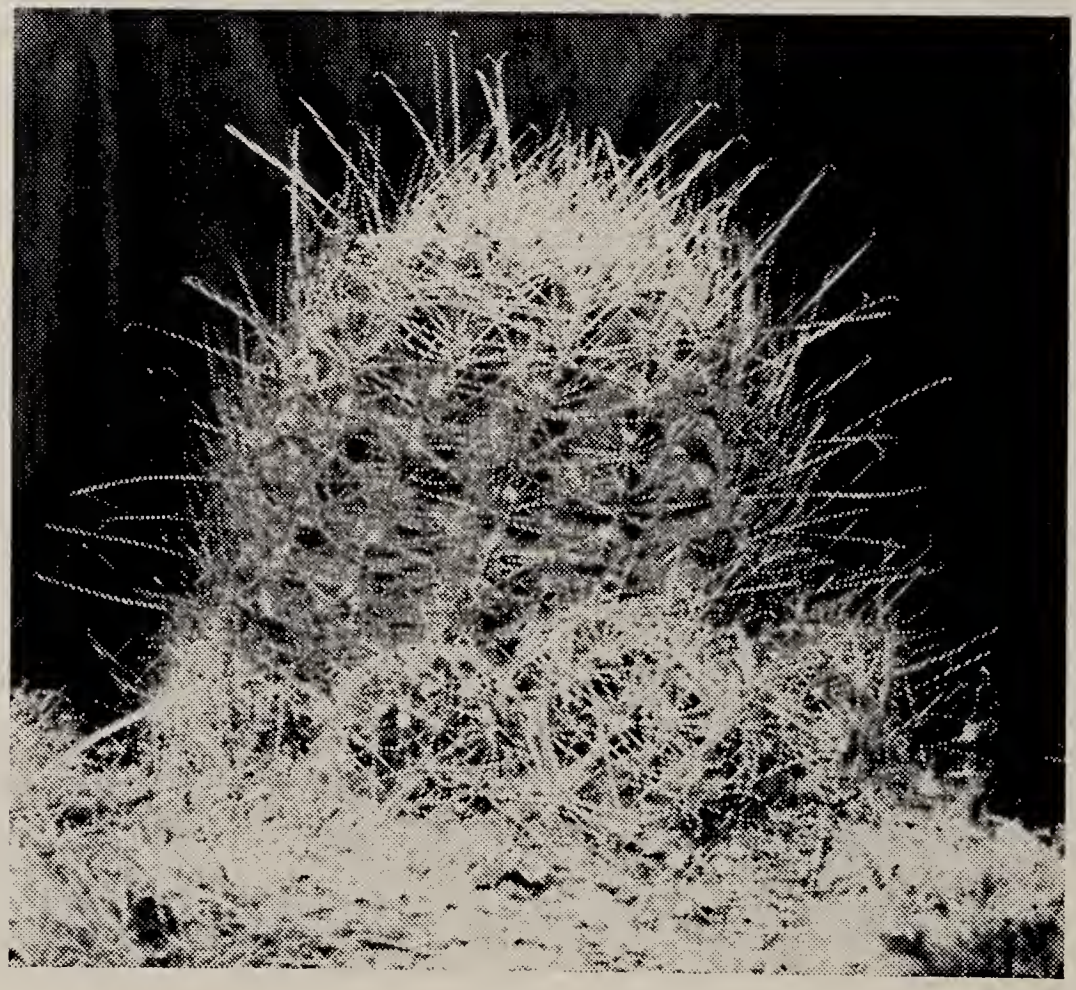
The genus Hamatocactus was also erected by Drs. Britton & Rose in Cactaceae, Vol. 3, page 104, the type species is Echinocactus setispinus Engelmann.

The plants included are globe-shaped to cylindrical, flabby in texture, ribbed, the ribs sometimes spiralled; the areoles are circular, according to Britton & Rose, but usually they are oval with the spine cluster in the lower part of the woolly areoles and flowers in the upper part and sometimes with elongated glands in the areoles between the spines and the flowers, the glands producing nectar; one or more of the spines are hooked, but not flattened; flowers funnel-shaped with a narrow tube and expanded limb; the ovary bearing a few scales, naked in their axils; fruit red, juicy but dehiscing by a basal pore.

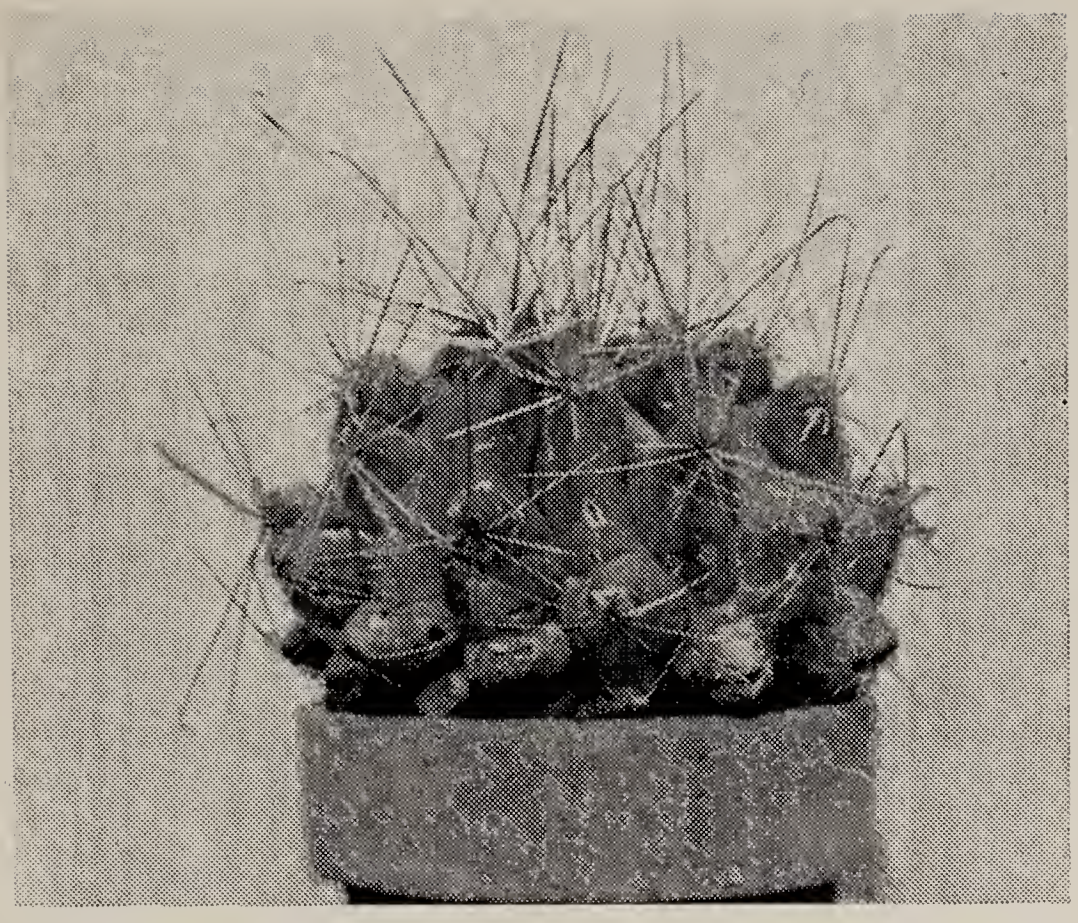
Hamatocactus setispinus is the familiar Texas species with large yellow flowers freely produced from the globe-shaped plant. Sometimes the species has red blotches on the green body but frequently it is all green. The spines are needle-like, one central spine is longer and strongly hooked. The flower is yellow usually with a red center.

H. setispinus setaceus Engelmann is the variety more frequently found in collections. It is cylindrical, never has the red blotches but otherwise resembles the species.

Hamatocactus hamatacanthus (Meuhlenpfordt) Borg is a much larger plant which also has several varieties. It is up to 8 inches high, barrel-shaped, flabby and has long areoles filled with wool and the lower part of the areole produces long, needle-like spines, at least one longer than the others and strongly hooked, the flowers come from



Hamatocactus hamatacanthus (Muehlenpfordt) Borg.
The barrel cactus of South Texas and Mexico.



Hamatocactus hamatacanthus (Muehl.) Borg.
A natural seedling. Some plants retain the large nipples into maturity and are then considered as var. Davisii.

the upper part of the areole and glands bearing nectar are sometimes found between the spines and the large yellow flowers.

H. hamatacanthus var. longihamatus is a more cylindrical plant but otherwise resembles the species.

A variation with the ribs formed of large nipples is found in collections under the name Brittonia davisii but should be referred to as H. hamatacanthus var. davisii.

To the genus Hamatocactus we must also assign the species Echinocactus uncinatus Galeotti which was assigned to Ferocactus by B. & Rose and to Thelocactus by me because the areole is so long as to practically constitute a groove. I now consider that all factors of Echinocactus uncinatus conform to the genus Hamatocactus except the flower color which is reddish-brown or greenish brown.

The long areole bears the needle-like spines, one hooked, in the lower part, the flowers in the upper part and glands between the spines and the flowers and the glands produce nectar. The fruit also agrees with Hamatocactus.

Backeberg erected the genus Glandulicactus for this species but Hamatocactus uncinatus is the most satisfactory solution of the plants placement as I see it.

ANISOCEREUS BACKEBERG OR PTEROCEREUS MacDOUGALL AND MIRANDA

Anisocereus Bckbg. or Pterocereus MacDougall & Miranda.

Britton & Rose in Cactaceae II, page 71, 1920 described a plant as Pachycereus? gaumeri sp. nov. without fruit description but supplied the description of the fruit in Cactaceae IV; 271, 1923. By their question mark they imply their uncertainty of its inclusion in Pachycereus.

On page 76 of Cactaceae II they assigned Cereus lepidanthus Eichlam to Pachycereus also but in a footnote stated that it more nearly paralleled the genus Escontria. In volume IV; 272 the description was supplemented and the fruit described.

Both plants were simple or few branched up to 20 feet tall with the stems terete or ribbed below and ribbed on their upper parts but P. gaumeri had 3 to 7 ribs, the ribs thin while P. lepidanthus had 7 to 9 ribs which were noted in the first description as low and separated by broad, rounded intervals but in the amended description in Vol. IV new growth shown on a plant had rather narrow ribs.

The flowers of both were described as narrowly funnelform and as bearing foliaceous scales on both ovary and tube with felt and spines or bristles, which are acicular spines, in the scale axils. The scales of P. gaumeri were described as foliaceous above, fleshy of base but tips thin and soon drying black. In P. lepidanthus the scales were described as membranous.

Fruits of both species bore the persistant floral remains and the fruits were scaly, the scales bearing felt and spines. The fruit of P. gaumeri becoming dry and the fruit of P. lepidanthus dry.

Backeberg in Blatter fur Kakteenforschung 1938-6 erected the genus Anisocereus with Cereus lepidanthus as its type and suggested that P. gaumeri also belonged here.

His generic description was "Aculi regionis florali non commutati; flores satis gracili- infundebuliformes vel augusti; in squamarum axillis paulum tomentose, non pilosi, inaculeati; fructus inaculeatus vel siccus, squamis cariosis, tomentosis, Guatemala."

His statement that the axils of the scales are "non pilosi, inaculeati" in the latin description of the Genus contradicts fact as the axils of the scales of Cereus lepidanthus are specifically noted by Britton & Rose (Cactaceae 11: 76. 1926) as bearing felt and bristles and Backeberg in his English description of the Genus Anisocereus says "scales of the fruit with felt and bristles, dry." (B.F.K. 1938-6).

In the genus Pachycereus (Berger) Britton & Rose Contr. U. S. Natl. Herb. 12:240, 1909, to which these two species were assigned by Britton & Rose, the flowers are diurnal and the ovary and the flower tube bears small scales nearly hidden by the mass of brown hairs arising from felt in their axils and the fruit bears no scales but is densely covered with clusters of deciduous spines and bristles to resemble a chestnut burr.

Cereus lepidanthus Eichlam and Pachycereus gaumeri Br. & R., therefore do not belong in the genus Pachycereus and Backeberg is fully justified in erecting for them his genus Anisocereus.

In Ceiba IV:2:135, 1954 MacDougall and Miranda erected their new genus Pterocereus and a new species P. foetidus based on a plant collected by them circa the barranca north of Chacona, 8 Km. northeast of Tuxtia Gutierrez, State of Chiapas, Mexico.

This is described as a simple or sparsely branched plant to 24 feet tall and up to nearly 6 inches in diameter in its lower cylindrical section but with terminal branches 3 or 4 ribbed or winged resembling an erect species of Acanthocereus.

The flower is nocturnal, narrowly funnelform, with a foetid odor, 8.5 - 9.5

Anisocereus gaumeri (Br. & R.) Bckbg.

cm. long, completely covered by large, fleshy scales. The scales imbricated, triangular-lanceolate and bearing felt and numerous, yellowish spines.

Fruit globose, red-carmine bearing the floral remains and large scales with felt and spines of dark red color and up to 20 or more. Dehiscence by irregular splitting.

In the same article MacDougall and Miranda have provisionally offered a new combination: - Pterocereus gaumeri (Br. & R.) MacDougall & Miranda with the reservation that the flowers and fruit do not agree completely with their new genus Pterocereus.

The differences are however rather minor. The flowers seem to agree in all particulars except that Pterocereus has strictly nocturnal and the other two species nocturnal flowers.

The fruits of Pterocereus are said to be fleshy while those of Pachycereus gaumeri are listed as "becoming dry" and those of Cereus lepidanthus as dry.

We are therefore compelled to decide between Anisocereus and Pterocereus for Pachycereus gaumeri as it has been provisionally placed in both genera by the authors of the two genera.

Since it is intermediate between the two species would it not be better to slightly amend the description of the genus having priority, Anisocereus, to include Pachycereus gaumeri and Pterocereus foetidus?

We certainly think so.

Accordingly we propose the following new combination:

Anisocereus Backeberg, Blatter fur Kakteenforschung 1938.

Pterocereus MacDougall & Miranda, Ceiba IV:2, 135, 1954.

Type species Cereus lepidanthus Eichlam.

Anisocereus lepidanthus (Eichlam) Backeberg Blatter fur Kakteenforschung 1938.

Pachycereus lepidanthus Britton & Rose Cactaceae 11:76 - 1920.

Anisocereus gaumeri (Br. & R.) Backeberg. Blatter fur Kakteenforschung 1938.

Pachycereus gaumeri Br. & R. Cactaceae 11:71 - 1920.

Pterocereus gaumeri MacDougal & Miranda Ceiba IV:2, 135, 1954.

Anisocereus foetidus (MacDougal & Miranda) Marshall combination nova.

Pterocereus foetidus MacDougal & Miranda Ceiba IV: 2, 135. 1954.

Hamatocactus uncinatus (Galeotti) Marshall, comb. nova.

The Staff expresses deep thanks to the numerous volunteer workers at the Cactus Show

We regret to advise our readers of the death of Mrs. Rose Collom, a pioneer botanist of the desert regions, at her family home at Edison, Georgia on Dec. 26th last.

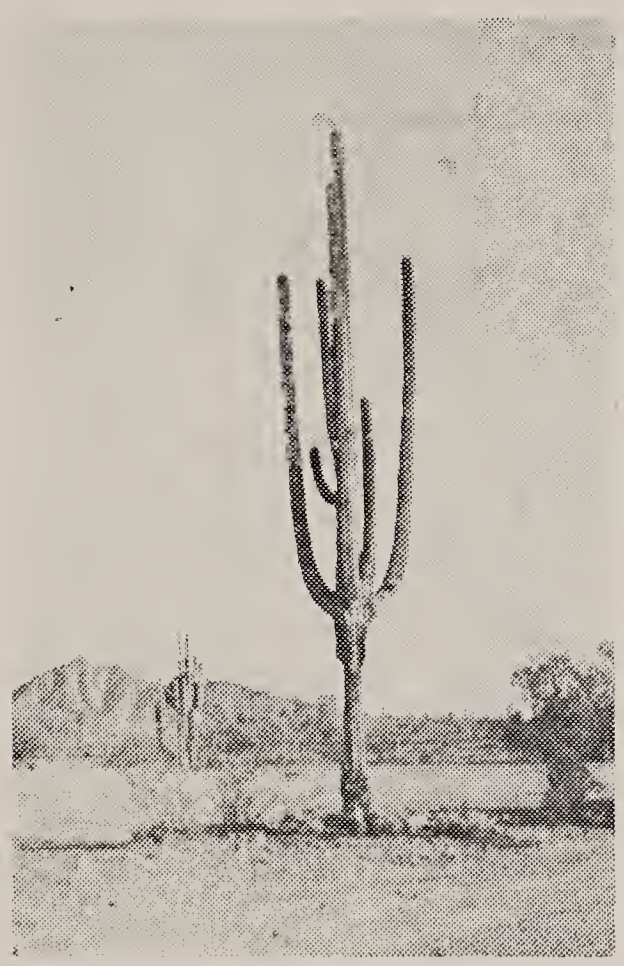
Mrs. Collom was an ardent collector and supplied living and herbarium material to many botanists and her name is perpetuated by many species dedicated to her, for example—Echeveria collomae.

Her valuable herbarium was presented to the Desert Botanical Garden five years ago.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

APRIL, 1957



VANDALISM —

REG MANNING

SAGUAROLAND BULLETIN

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W. TAYLOR MARSHALL, Editor

Volume 11 APRIL, 1957 No. 4

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August Hermann, Sylvia Hermann

Garden open every day except Monday, from 10 A.M. to 4:45 P.M.
No charge for admission.

EDITORIAL

The annual meeting of the Arizona Cactus and Native Flora Society will be held in Webster Auditorium of the Desert Botanical Garden on Sunday, April 21st (Easter), at 3 P. M. All members are invited.

At that meeting a report on the past year's finances and progress will be made and the election of two members for the executive board will be decided.

An inovation for this year will be noted in a call to the Advisory Board to meet at the time of the Annual meeting.

The two meetings will be coincidental and no other meeting of the Advisory Board will be held this spring.

As required by the By-Laws the Executive Board will meet on Monday evening, April 22nd, to consider the report of the current year's activities and to consider the budget for the 1957-58 year which begins May 1st. Notices of this meeting will be mailed to members of the Executive Board.

VANDALISM

The most expensive factor in the operation of a garden such as ours is the effort we make to protect our plants against vandalism by the general public. This necessitates a continuous watch on our visitors by guards employed by us to prevent the destruction of plants by the one vandal in every 1,000 visitors.

That we are not completely successful in our efforts can be demonstrated by an incident which occurred recently.

We had a 40-foot Saguaro at least 200 years old just outside the inner fence at the junction of the two roads leading into the garden and inside the outer fence and gates which are closed except during visiting hours.

Early in January on a rainy day one of the many visitors who have taken pictures of that Saguaro cut into the plant with a pen knife to see what was inside.

In the damp weather the Saguaro was unable to seal off the wound as it could in dry weather and an infection set in which destroyed our big plant in about 40 days.

Our pictures illustrate the damage caused by this particular vandal.

Number 1 shows a view of the full plant after the infection had progressed to a point which weakened the plant to a degree that made it a hazard to visitors, and picture number 2 is a closer shot showing the complete deteriation of the tissues of the main trunk exposing the vascular bundles. At this stage a heavy gust of wind would cause the plant to fall.

We found it necessary to cut it down and our third picture shows the fallen giant which still weighed about 3 tons

One careless puncture at the wrong time killed a plant which had stood for two hundred years.

Fig. 2. Vandalism. A close-up of the stem injured by cutting.

Fig. 3. Vandalism. A view of the fallen giant after injuries inflicted by a visitor.

THE FISHER COLLECTION

Kenneth R. S. Fisher is a retired Ford engineer who lives in Mesa, Arizona with his charming wife Renee.

Mr. Fisher has been interested in Cactus for many years and was one of the first collectors to contact me when I first came to the Desert Botanical Garden nearly 11 years ago.

He was a member of our first expedition into northern Arizona and Utah in 1947 and the friendship which was engendered by that trip has continued through the years.

He was always generous to the garden, and willing to share with us specimens of his treasured plants when duplicates were available. We have received from him many species that we would not otherwise have been able to show.

Since that first collecting trip with us in 1947, Mr. Fisher has made numerous collecting trips into Mexico where he acquired specimens of hundreds of species so that his collection now numbers about 960 plants.

These have been housed under lath shelters on specially built tables in front of the family trailer in Mesa and tended with expert and loving care so that today they are all specimen plants of show quality.

Both Mr. and Mrs. Fisher have been in poor health for some years and they must leave the valley for cooler regions each summer and this creates a problem for the proper care of the plants during their absence.

The decision to dispose of his collection brought the question of their new home and he was unwilling to see them fall into the hands of persons who might not give the proper care to the plants. True the collection could be sold for $2,000 or more but if this were done

how long would the collection survive in unexpert hands?

Mr. Fisher felt that so valuable a collection should be preserved for posterity and he decided to give the entire collection to the Desert Botanical Garden where it will be displayed as a unit and where it will receive care by experts.

On March 9th, with the aid of volunteer helpers, we moved the entire collection, tables and lath shelters to the garden and the following week the job of repainting and reerecting the shelter were undertaken by the staff as time could be taken from the other garden duties.

When complete the collection will be shown much as it was displayed at Mesa. In an area not previously open to the public the tables will be arranged so that all of the plants can be seen but not handled and new paths will be outlined although they will not be black topped until we have closed for the summer.

Mr. H. Pratt, Jessie W. Dodd, Jr., Clarence Oskins and Edward Stocks were the members who did the heavy work of moving for us while Mrs. Pratt cared for the Book Counter and John Hales acted as a guard while our staff was in Mesa.

The collection consists of many rare species of Mammillarias from Mexico, Echinofossulocacti, Toumeyas and many other genera all potted and it includes many cristates.

The various species of night flowering Cerei and the barrel cactuses will be added to our already large collection of such species in the areas already planted to barrels and night blooming Cerei.

This generous gift is the largest in our history except the Webster collection and the Marshall collection, each of which consisted of 2,000 plants or more. We hereby express to Mr. and Mrs. Fisher our sincere appreciation of their gift.

—W. T. M.

MORE BARREL CACTUSES

ECHINOMASTUS OR HEDGEHOG BREAST

The genus Echinomastus was erected by Britton & Rose in Cactaceae III:147, 1922, and was placed by them in the sub-tribe Echinocactanae. Several if not all of the species are frequently referred to as "barrel cactuses."

Britton & Rose did not comment on one important factor of these plants, the fact that flowers are borne at the base of a groove on the upper part of the nipples in a manner similar to the Coryphanthas. This fact was first noted by J. P. Hester in Cactus & Succulent Journal V:503, 1934.

In 1941 in Cactaceae, Marshall & Bock, the genus was moved into the sub-tribe Coryphanthanae and its similarity to the genus Thelocactus was noted.

Echinomastus is a genus of similar plants which can be recognized at sight by anyone familiar with cactus plants even before checking the identifying factors of grooved tubercles and many spines at areoles and relatively large flowers which are magenta to rose colored, yellow or white.

Today we know eight species and three varieties in the genus of which 4 species and one variety are found in Arizona and 2 species and 1 variety in Texas. The remaining species are native to Mexico.

The species best known is Echinomastus johnsonii and its variety lutescens both of which are referred to as "barrel cactuses."

E. johnsonii is frequently found in association with the Joshua Tree (Yucca brevifolia) at elevations from 3,500 to about 6,000 feet in the Mojave Desert of California, Arizona and Nevada. It is globose or cylindrical up to 14 inches

Turn to page 45

Fig. 4. *Echinomastus johnsonii* (Parry) Baxter var. *lutescens*. Parrish. R. C. Proctor photo.

Fig. 5. *Echinomastus erectocentrus* (Coulter) B. & R.
R. C. Proctor photo.

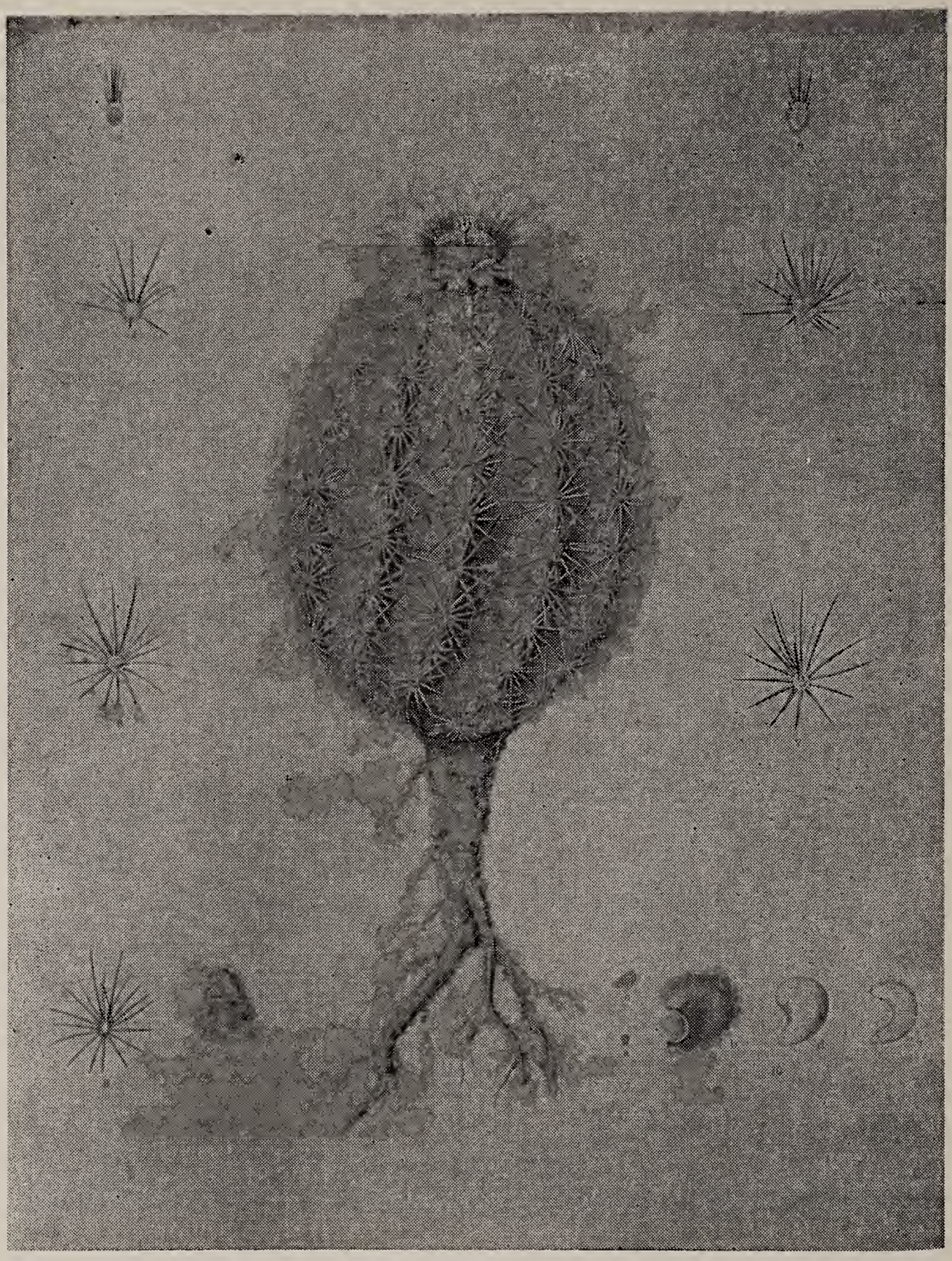

Fig. 6. *Echinomastus intertextus* (Eng.) B. & R. A plate from U.S. - Mexico Boundary Survey 1859.*as Echinocactus intertextus*

The article on Echinomastus is a summary of a talk by Sylvia Hermann at the March meeting of the Cactomaniacs

tall and about 5 inches in diameter and the plant body is completely hidden by the heavy needle-like spines which may be almost white, horn colored, pink or maroon on individual plants. The flowers are relatively large, opening to 2½ inches and pink to magenta.

E. johnsonii variety lutescens Parrish resembles the species in all respects except that the flowers are larger and chartreuse in color with a maroon eye.

E. erectocentrus is indigenous to Arizona where it is found in Cochise County in the southeastern corner of the State on desert grassland.

It is a globose plant usually about 5-6 inches tall and slightly less in diameter and the white radial spines are arranged comb-like on the areoles with 1 or 2 reddish to purplish spines in the center of the areole and these stand erect, perpendicular to the ground. The 1½ inch flowers are pale pink or pale lavender.

E. acunensis was mistaken for a form of E. erectocentrus in the eastern part of its range along the Florence-Tucson highway, but it differs in many respects. The size is similar but the spines are dirty white with reddish-brown tips and they all are erect and not in comb-like arrangement. The flower is 2 inches or more broad when fully extended and coral pink to mallow in color.

E. intertextus, the fourth Arizona species is found in eastern Pima County to Cochise County and continues thru New Mexico to Texas at 3,000 to 5,000 ft. elevation.

It is small cylindrical but at first biscuit-shaped, 3 to 6 inches high with a tapering root. The ribs can be seen thru the few spines which are short and needle-like, 12 to 20 of them radial and less than ½ inch long; 3-4 central spines are reddish, stout, rigid. The small flowers are 3/4 inches broad and dirty white.

E. intertextus var. dasyacanthus is a spinier variation of the Arizona species that is found from El Paso eastward.

E. mariposensis is a relatively new species from the Big Bend country of Texas. It was described by Hester in 1945 based on plants collected at Mariposa, Texas and was collected again by a Garden expedition near Terlingua in the Big Bend National Park. It is available from dealers.

E. mariposensis is nearly globose 5-6 inches high and the plant is hidden by numerous heavy needle-shaped, gray, horn colored or yellow spines. The flower is rather small, less than 2 inches, and is a dirty white.

The remaining 3 species are Mexican. E. macdowellii, a beautiful white spined species, with a deep purple flower which is occasionally seen in cultivation, E. mapimiensis Bckbg which is illustrated by Britton & Rose in Cactaceae III:148 as E. unguispina.

E. unguispina, the clawed hedgehog breast which is very scarce. In fact the writer has not seen it since it was collected about 20 years ago by the late Dr. Lowrey of Laredo, Texas. Its variety E. unguispina var. durangensis has been collected several times by expeditions from our garden.

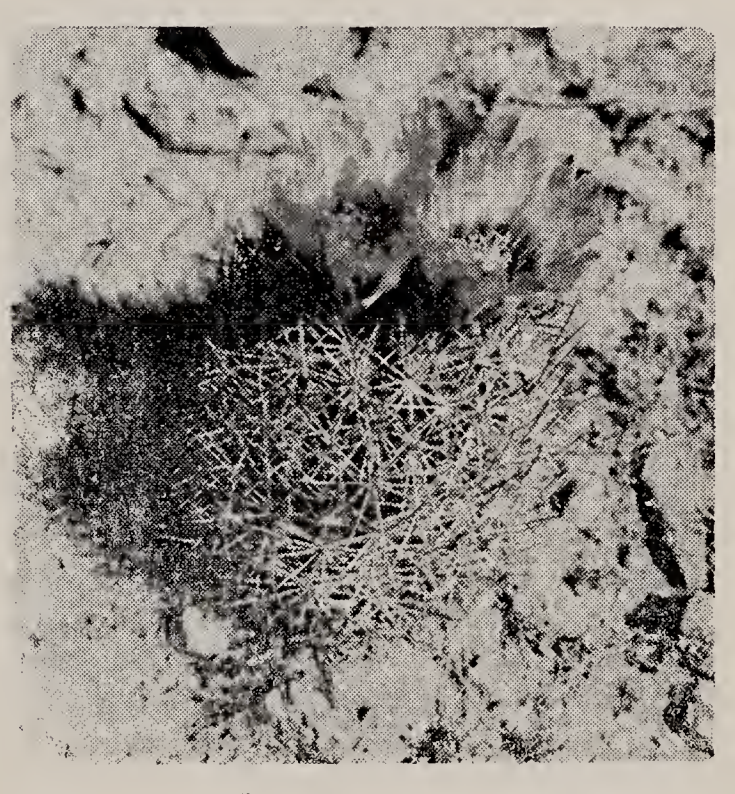

Fig. 7. *Echinomastus acunensis* Marshall.

AWARDS FOR THE TENTH ANNUAL CACTUS SHOW

Fig. 8. Mrs. Sylvia Hermann's entry was admired.
John Eversole photo.

The tenth annual Cactus Show was very successful in spite of 4 rainy days. The attendance was just a little less than last year due to the weather but the exhibits were much finer in all respects than in previous years.

Winners in the various classes were as follows:

Sweepstakes — Sylvia Hermann
Rarest Cactus — William Rand
Rarest Succulent — Fred McClure
Best Potted Specimen — Manuel Diaz
Best Collection of 10 Succulents — Mrs. Richard Williams
First—Fred McClure
Best Centerpiece of Succulents — John Hales
Best Centerpiece of Cactus — Mrs. R. I. Turner
Best Novelty Container of Cactus and Succulents — Mrs. H. Covert
Best Arrangement of Dried Material — Mrs. Sylvia Hermann
SECTION A — POTTED SPECIMEN PLANTS

1. One Species of Cactus:
   First—Manuel Diaz
   Second—William Rand
   Third—Charles Mieg
2. Seedling Cactus:
   First—Sylvia Hermann
   Second—Donald Bauer
5. One Species of a Succulent Plant other than Cactus:
   First—Manuel Diaz
   Second—Sylvia Hermann
   Third—Fred McClure
   H. M.—Laura Nixon
6. Desert Trees or Shrubs. One Species Potted:
   First—Sylvia Hermann
   Second—Fred McClure

SECTION B — COLLECTIONS OF POTTED PLANTS

1. Cacti, at least five species:
   First—John Hales
   Second—Fred McClure
   Third—Mrs. Richard Williams
   H. M.—Ed Stocks
2. Succulents, at least five species:
   Third—Ed Stocks
3. Desert Trees or Shrubs, at least five species:
   Second—Ed Stocks
   Third—Ed Stocks
4. Cacti, ten species or more:
   First—Mrs. Sylvia Hermann
   Second—Fred McClure
   Third—Mrs. R. I. Turner
   Special—Donald Bauer
5. Succulents, Ten species or more:
   First—Mrs. Richard Williams
6. Collection of 5 plants of one genus—Cactus:
   First—Sylvia Hermann
   Second—Manuel Diaz
   Third—Mrs. Nola Belford
7. Collection of 5 plants of one genus—Succulents:
8. Collection of 6 or more plants of one genus—Succulents:
   First—Fred McClure
   Second—William Rand
   Third—Fred McClure
10. Collection of 6 or more Chollas:
   First—Ed Stocks
11. Collection of 6 or more Prickly Pears:
   First—Sylvia Hermann
   Second—Ed Stocks
12. A separate number will be assigned to a collection of 6 or more plants of a genus. Therefore any genus can be entered.
   Pediocactus:
   First—Sylvia Hermann
   Gymnocalycium:
   First—Fred McClure
14. Notocactus:
   First—Fred McClure
16. Echinopsis:
   First—Fred McClure
17. Ariocarpus:
   First—William Rand
18. Toumeya:
   First—Ken Fisher

SECTION C — DISH GARDENS (Accessories Permitted)

2. Dish garden 8" or less—Succulents:
   First—Sylvia Hermann
3. Dish garden 8" or less—Cactus & Succulents:
   First—Lynda Covert — Junior Award
4. Dish garden over 8½"—Cactus:
   First—Mary Lowman
5. Dish garden over 8½"—Succulents:
   First—Sylvia Hermann
   Second—Isabelle Holt
   Third—Mrs. George Probert
6. Dish garden over 8½"—Cactus & Succulents:
   First—Mrs. I. R. Turner
   Second—Sylvia Hermann
   Third—Isabelle Holt
7. Miniature Cacti in containers:
   First—Sylvia Hermann
8. Strawberry Jar 14" tall or less:
   First—Sylvia Hermann

SECTION D — ARRANGEMENTS WITH ACCESSORIES

1. Cacti for centerpiece:
   First—Mrs. R. I. Turner
   Second—Mrs. Harold Covert
   Third—Mrs. Richard Williams
2. Succulents for centerpiece:
   First—Mrs. H. Covert
   Second—Mrs. Richard Williams
   Third—Mary Lowman
   Special—John Hales

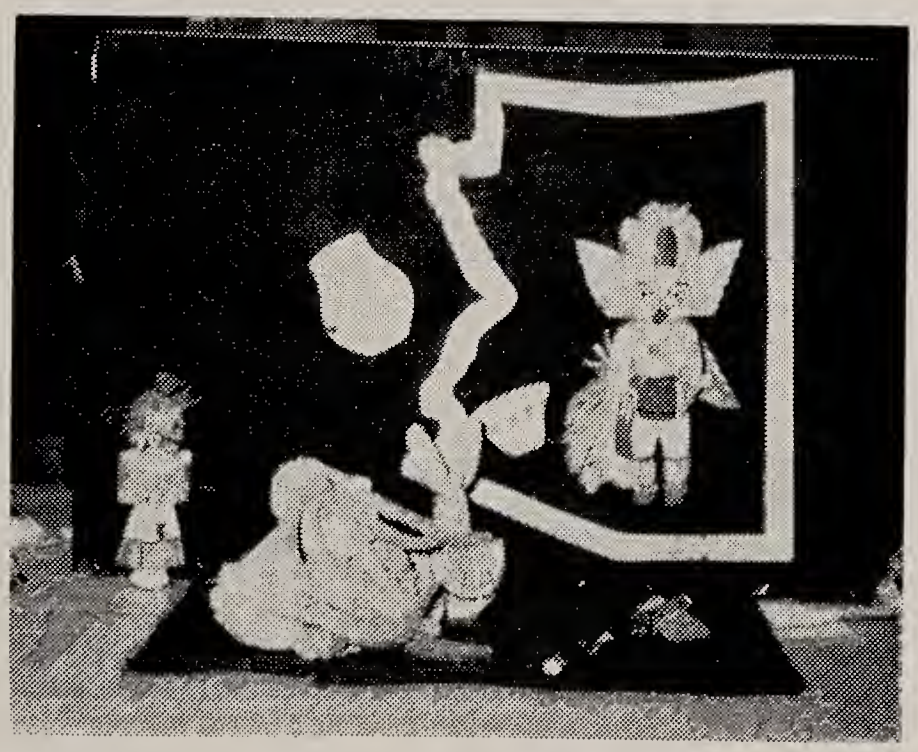

Fig. 9. Section D-6 Winner entered by Mrs. Harold Covert. John Eversole photo.

2a. Succulents against wall
First—Sylvia Herndan
Second—Mrs. Harold Covert

3. Cacti and Succulents for centerpiece:
First—Sylvia Hermann
Second—Mrs. R. I. Turner
Third—Sylvia Hermann

4. Cacti with garden flowers as accessories:
First—Isabelle Holt
Second—Sylvia Hermann
Third—Mrs. R. I. Turner

5. Succulents with garden flowers as accessories:
First—Mrs. R. I. Turner

6. Cacti, American Indian influence:
First—Mrs. Harold Covert
Second—Mrs. Harold Covert
Third—Mrs. Richard Williams

7. Corsage of Succulents:
Sylvia Hermann

9. Novelty container with Cacti:
First—Mrs. R. I. Turner
Second—Mrs. E. S. Tanner
Third—Ruth Conaway
Junior First—Lynda Covert

10. Novelty ocntainer with Succulents:
First—Isabelle Holt
Second—John Hales
Third—Mrs. H. Covert
H. M. Sylvia Hermann

11. Novelty container with Cacti and Succulents:
First—Mrs. Harold Covert
Second—Mrs. R. I. Turner

12. Button Gardens:
First—Sylvia Hermann
Second—H. E. Pratt
Third—M. W. Pratt

13. Arrangements with Dried Material:
First—Mrs. R. I. Turner
Second—Mrs. E. S. Tanner
Third—Isabelle Holt
H. M.—Mrs. Harold Covert
Special—Sylvia Hermann

14. Miniature arrangements:
First—Lynda Covert (Jr.)
First—Sylvia Hermann
Second—Mrs. R. I. Turner
Third—Mrs. R. I. Turner

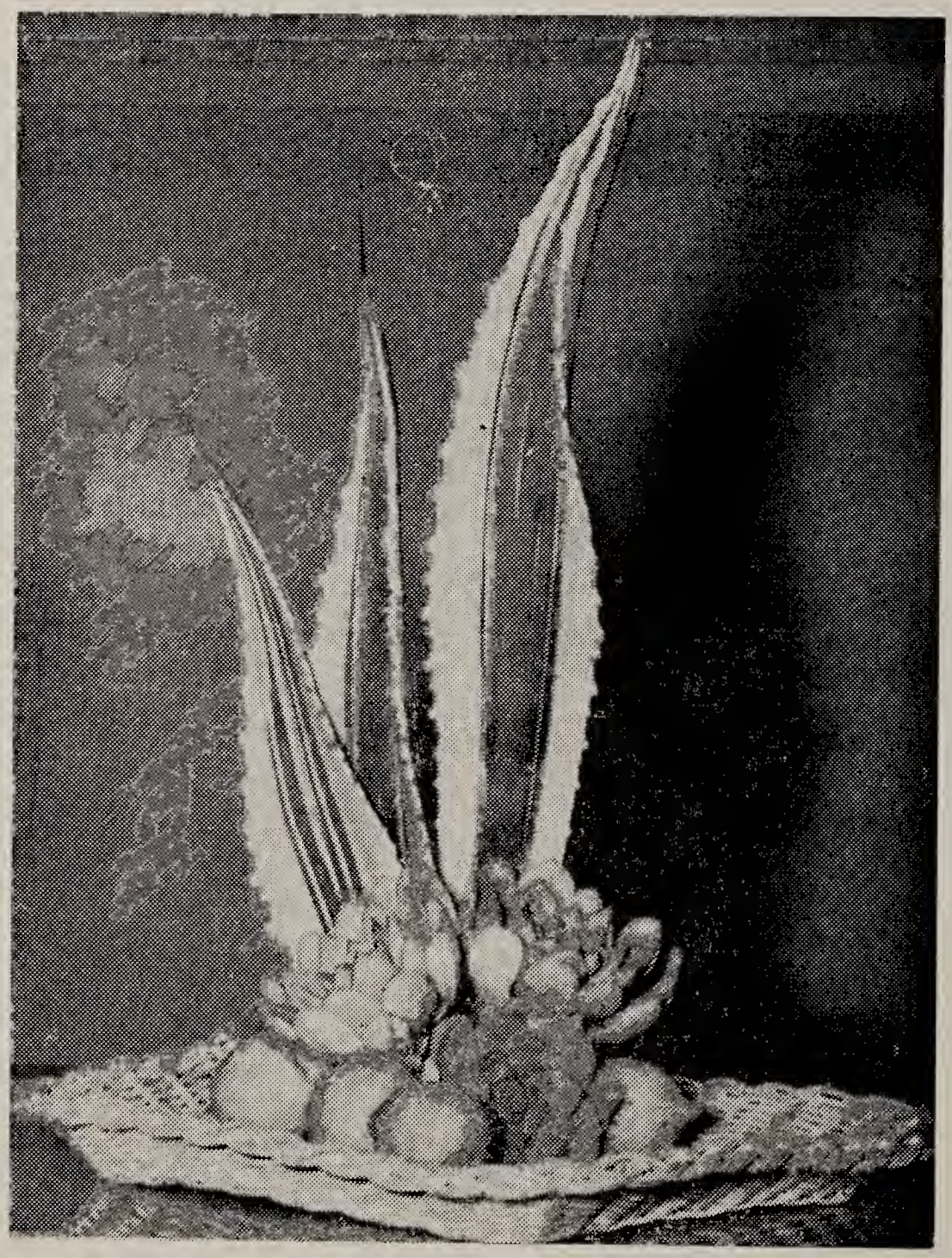

Fig. 10. Entry of Mrs. Sylvia Hermann in class D-2.
John Eversole photo.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

MAY, 1957

Echinocereus fendleri var bonkerae
(Thornber & Bonker) L. Benson

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

Volume 11 MAY, 1957 No. 5

Arizona Cactus and Native Flora Society

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August Hermann, Sylvia Hermann

Garden open every day except Monday, from 10 A.M. to 4:45 P.M. in May
Open only Saturday and Sunday, 1 to 6 P.M., in June

EDITORIAL

The Annual Meeting of the Society was held in the Webster Auditorium Sunday, April 21st, at 3 P. M. and when the ballots for the two vacancies on the Executive Board were counted the incumbent members, John H. Rhuart and Edward Burrall, were unanimously reelected to office.

A report of the year's finances, while incomplete because our fiscal year does not end until April 30th, showed that we could expect that our income would be—

Proceeds from the Webster Trust	$10,900
Membership fees	1,800
Contributions	1,200
Profit on sales	5,000
	$18,900

While expenses for the year were:

Cactus Show expenses	$ 213.16
Auto operation	175.00
General expense	2,800.00
Insurance	650.00
Salaries	13,337.00
Utilities	725.00
	$17,900.16

For new buildings (Capital expenditure)—

Car port and Warehouse	1,072.92
New Fencing	1,164.84
	$20,137.92

This required a depreciation of about $1,200 from our slim reserve and causes considerable concern about getting through the summer months when we have no income and increased overhead.

An exact report for the fiscal year will be given in our June-July Bulletin which will be mailed about July 1st.

CACTUS CONVENTION

The Cactus and Succulent Society of America will hold its biennial convention in Berkeley, California, in July and they invite all persons interested in Cactus or other Succulent Plants to attend.

The writer regrets that he will be unable to make the trip, because of an allergy to moist air, and this will be the first convention he has missed.

Many of our members and friends will attend and we will expect many of them to stop at the Desert Botanical Garden en route to or from the convention and we will be here to welcome them.

The public gates will be closed but our visitors may enter through the residence gate which is always open.

For full information on the Convention write to Myron Kimnoch, 5918 Jordan Ave., El Cerrito, 9, Calif.

NEW BOOK

The Rancho Santa Ana Botanic Garden has published "Native Plants for California Gardens" by Lee W. Lenz, which our book store will stock. It describes 101 species of natives, many of them desert dwellers, suitable for local gardens in Arizona as well as California.

182 pages, cloth bound, 100 half-tone illustrations, 1 color plate. Price $3.85—add 15c postage on mail orders.

This will be reviewed in our next Bulletin.

THELOCACTUS

Buckii (Klein) Br. & R.

Echinocactus buckii, Klein

This very interesting plant has been known only from Klein's description published in Gartenflora in 1859 and illustrated by a woodcut. In the text the name Echinocactus Buckii was given, presumably to honor Dr. Johannes Nicolaus Buck, a botanist and physician of Frankfort, Germany, but the woodcut was captioned Echinocactus buekii.

The type locality was given as "Mexico" which is not a great aid in identification.

The original description tended to increase confusion as to the identity of the plant because of its incompleteness. Britton & Rose translate the description as follows: — stem simple, deep green; tubercles distinct, somewhat pointed, angled; spines about 7, reddish, unequal, some of them outwardly curved, the longer ones much elongated; flowers dark red; inner perinath segments narrow.

Schumann thought it to be Echinocactus tulensis and referred it to the synonymy of that genus but it differs in many respects from the description and illustration of that species.

Thelocactus buckii (Klein) Br. & Rose

Britton & Rose knew it only from the original description and illustration in Gartenflora and retained it as a species while noting that its relationship must be with Echinocactus rinconensis Poselger.

Echinocactus (Thelocactus) buckii has been only a name for many years but last year a plant that fitted the description was collected by Denis Cowper and sent to us for identification but this plant was completely dehydrated and soon died.

Howard E. Gates had collected some plants near San Luis Potosi, Mexico several years ago in association with Thelocactus fossulatus which we could not identify and which Dr. Bravo did not recognize when Gates showed them to her. One of the original collections by Gates was sent by him to us in bud and it later flowered (see illustration) and we identify it as Thelocactus (Echinocactus) buckii (Klein) Br. & R.

The bud of the flower is deep red but the petals have only a wide mid-stripe of dark red with yellow margins but they are quite narrow and we must presume that Klein was working with dried flowers which appeared red when dehydrated.

Gates has grown about 50 seedlings of T. buckii which are now about 2 inches in diameter and which he quotes at 75c each. A reasonable price for a rare plant.

So now it is possible to add to your collection a plant that has been known only by description since 1859.

Incidentally Gates has a new, beautiful illustrated catalogue of the plants he offers at retail which he will send to prospective purchasers on request.

THE GENUS ECHINOCEREUS

A SERIES OF ARTICLES

No. 1 Echinocereus fendleri

In the years 1937 and 1938 the late Dr. R. W. Poindexter and the late Clarence Clum made extensive investigations into the species of the genus Echinocereus which necessitated the consolidation of a number of the species listed for the genus by Britton and Rose in Cactceae III — 1922.

Extensive field trips were made by them and a vast amount of collected material was cultivated at Compton, California, in Dr. Poindexter's nursery. The writer was privileged to see all this material and to participate in the conclusions of Dr. Poindexter and Mr. Clum.

As a result some suggestions for the consolidation of a number of taxa was suggested by me in Cactaceae, Marshall & Bock 1941. Dr. Lyman Benson as the result of independent studies of the flora of Arizona effected many of the suggested combinations in Proceedings of thc California Academy of Science XXV: 1944.

His work was incorporated with his permission in our Arizona's Cactuses 1950 but covered only the species and varieties found within the State of Arizona.

This present work is an attempt to clarify the entire genus Echinocereus in so far as all the above mentioned studies have progressed plus the results of investigations by the staff of the Desert Botanical Garden for the past ten years.

Since our first and greatest interest is in the species found in Arizona and in preparation to the printing of a revised edition of Arizona's Cactuses we will consider the Arizona species first. We will, however, include the variations of such species as found anywhere in the United States or Mexico, the two countries to which the genus Echinocereus is limited.

ECHINOCEREUS FENDLERI
KEY TO VARIETIES

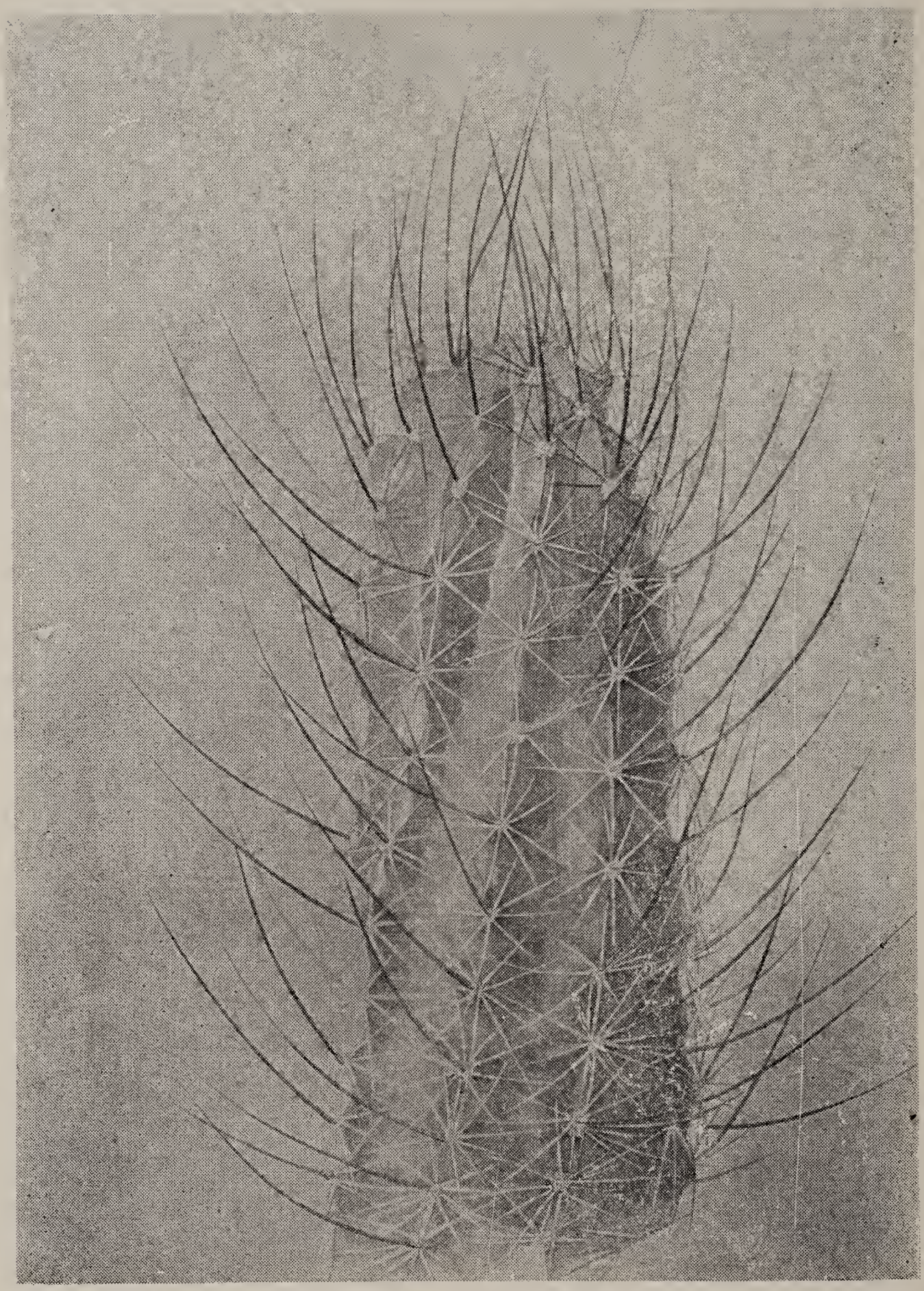
A. Principal central spine porrect or ascending sometimes with 1 or 2 small accessory centrals. Central spines circular in cross section.
  B. Radial spines few, 8 to 11, aciculars, flatly spreading.
    C. Central spine elongated (1 to 2 inches) ascending.
      1. E. fendleri fendleri.
    C. Central spine short, porrect (½ to 1 inch).
      2. E. fendleri rectispinus.
  B. Radial spines more numerous tending to conceal plant body.
    D. Central spine(s) perpendicular to stem, subulate, stiff, sometimes absent in one nippled (juvenile?) form.
      3. E. fendleri bonkerae.
    D. Central spines flexible. Transitional to E. engelmannii.
      Central spines porrect.
        4. E. fendleri-boyce-thompsonii.
      Central spines usually deflexed.
        5.E. fendleri robustus.

Echinocereus fendleri (Engelmann) Rumpler in Forster, Handb. Cact. ed. 2.801. 1885.

Cereus fendleri Engelmann in Gray. Pl. Fendl. 51. 1849.

Cereus fendleri pauperculus Engelmann in Gray. Pl. Fendl. 51, 1849.

Clumps not dense, the stems 1-5 or perhaps more, not crowded against one another, ovoid, 7-15 cm. in diameter, flaccid, ribs usually about 9-10, not markedly tuberculate at the areoles; spines not obliterating the surface of the stem, central spine 1, at first very dark brown to black, gray in age, turned upward from the base, tapering, 2-4.5 cm. long, stout, slightly curving upward the entire length, rigid, not flattended;



Type species of E. fendleri Eng. as illustrated in
U. S.-Mexico Boundary Survey 1859.

radial spines 9-11, similar to the central but shorter and white or pale gray; areole circular, not bearing white felt at maturity.

Type locality:—Near Santa Fe, New Mexico.

Distribution:—Grasslands at 500 to 7,000 feet elevation in northern Arizona, southern Utah, northern New Mexico and Texas.

The species was named for August Fendler who collected extensively in New Mexico and Venezuela.

A specimen that is atypical in its robust spination was illustrated in Cactaceae, Britton & Rose plate IV, figure 3. A typical plant was illustrated in Cactaceae of the Boundary plate 51 as Cereus fendleri which we reproduce in fig. 1.

Throughout its very extensive range from central Texas and Coahuila, Mex., New Mexico, southern Colorado, Chihuahua and Sonora, Mexico, Arizona and southern Utah and an altitude range from about 1000 feet to 7000 or 8000 feet, a very considerable variation occurs but intergrading between the varieties is so pronounced that several species have been erected for outstanding differences but these differences, because of intergradation can be given varietal rank only.

In its western range it meets Echinocereus engelmannii and there two of the varieties are transitional to that species.

Echinocereus fendleri var. rectispinus (Peebles) Benson. Proc Calif. Acad. Sci. XXV:252. 1944.

Echinocereus rectispinus Peebles. Amer. Jour. Bot. 25: 9:675. 1938.

Stems 1-5, usually 1-2 dm. high, 6-9 cm. in diameter, firm, the ribs 8-10; central spine perpendicular to the stem, straight, 1.2-2.5 cm. long, in some areoles accompanied by small accessory centrals, rigid, rather stout; flower about 6-6.5 cm. in diameter.

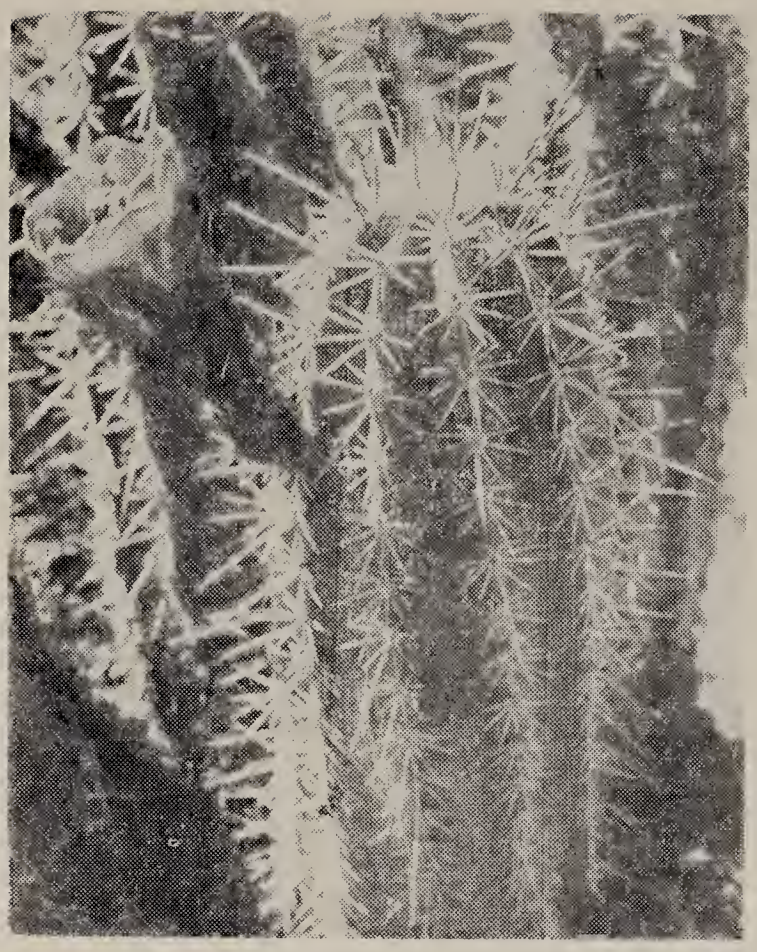
Echinocereus fendleri var. rectispinus (Peebles) Benson.

Type locality — Santa Catalina Mountains.

Distribution—Southern Arizona, New Mexico and Texas, Chihuahua and Coahuila in desert grassland on slopes or mesas at 3500 to 5500 feet elevation.

This straight spined variety was collected by Drs. MacDougal and Shreve

Echinocereus fendleri.
This form transitional from var. rectispinus to var. robustus.



Echinocereus triglochidiatus - a form resembling E. fendleri var. rectispinus

on the eastern side of the Santa Catalina Mountains and at Oracle in 1921. Britton and Rose included it in their Echinocereus fendleri but suggested that further study might prove it to be a distinct species. It was illustrated in Cactaceae III, figure 45, as Echinocereus fendleri.

Mr. Peebles recognized it as a distinct species in 1938 but Dr. Benson in 1944 reduced the species to a variety.

In this decision we are in full accord based on our studies over the entire range.

Several variations of Echinocereus triglochidiatus exactly resemble E. fendleri var. rectispinus when not in flower but when in flower the large, bell-shaped, purple flower of E. fendleri could not be mistaken for the salver-form, rather small, crimson to scarlet flower of E. trighlochidiatus.

Echinocereus fendleri var. bonkerae (Thornber & Bonker) Benson

Echinocereus fendleri var. bonkerae (Thornber & Bonker) Benson. Proc. Cal. Acad. Sci. XXV: 252. 1944.

Echinocereus bonkerae. Thornber & Bonker. The Fantastic Clan., 1932.

Echinocereus boyce-thompsonii var. bonkerae Peebles. Cact. & Succ. Journ. Amer. 1950.

Clumps rather dense for the group, the stems usually 5-15, 1.2-2 dm. high, 3.5-6.5 cm. in diameter, rather firm, ribs 11 or 13-16; central spine 6-8 mm. long, accompanied in some areoles by 1 or 2 accessory centrals, perpendicular to the stem, rigid, white or pale gray tipped with brown; flower tending toward purple, about 6-6.5 cm. in diameter, the petals and sepals more nearly rotate than in the other varieties, or even slightly reflexed.

Type locality:—Pinal Mountains at 4,000 feet.

Distribution:—Southern Arizona from the Pinal Mountains, Catalina Mountains to the Graham Mountains, at Globe and north of Globe to the White Mountains, where it is a small, globose, nippled plant with only 4 flattened, radial spines in cruciform arrangement.

The small White Mountain plant bears no resemblance to the specimens from the south but when grown at the lower elevation in cultivation it becomes ribbed and the spines are then exactly as described for the variety bonkerae.

In the White Mountains this small form could be mistaken for a form of Toumeya peeblesiana.

A transitional form of Ecer. fendleri between var. bonkerae and var. rectispinus

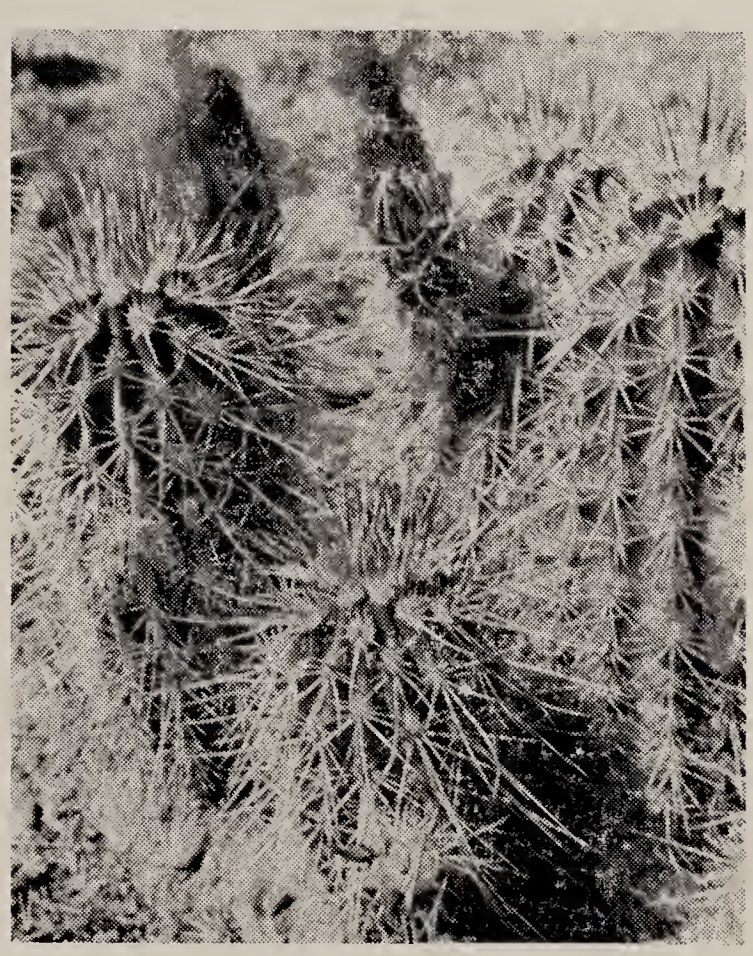
Ecer. fendleri var. boyce-thompsonii (Orcutt) Benson.

Echinocereus fendleri var. boyce-thompsonii (Orcutt) Benson. Proc. Cal. Acad. Sci. XXV:252. 1944.

Echinocereus boyce-thompsonii Orcutt, 1926.

Stems 1-10, 1-2.5 dm. high, 5-7.5 cm. in diameter, rather firm, ribs 12 or commonly 14-18 or sometimes more; central spine 2.5-4 cm. long, accompanied in at least some areoles by 1 or 2 accessory centrals, perpendicular to the stem or more commonly deflexed, straight, flexible, very slender, remarkably light-colored, either straw-colored, reddish, or white (gray in the two preceding varieties); flower usually about 6-6.5 cm. in diameter. This variety is transitional in some of its forms to Echinocereus engelmannii.

Rocky slopes or grassy uplands in the upper part of the Sonoran Desert, the Desert Grassland, the Southwestern Coniferous Woodland, and the Southwestern Oak Woodlawn at mostly 2,500 to $5,500 feet elevation. Central Arizona from the vicinity of Seligman



Transitional form of Ecer. fendleri between var. boyce-thompsonii & var. robustus

southeastward just below the Mogollon Rim to the Upper Gila River Valley. Flowering from March until May.

As this range overlaps that of E. engelmannii it is sometimes difficult to separate the species. Usually E. fendleri has but a single, long central spine with one or two small axillary ones while E. engelmannii has 2 to 6, large and well developed central spines.

Echinocereus fendleri var. robustus (Peebles) Benson. Proc. Cal. Acad. Sci. XXV: 252. 1944.

Echinocereus rectispinus var. robustus. Peebles.

Echinocereus robustus. Peebles, 1940.

Stems 5-20, 1.7-4:5 dm. high, mostly 8-10 cm. in diameter, ribs 8-13, firm; central spine straight, perpendicular to the stem, 2.5-7.5 cm. long, in some areoles accompanied by small accessory centrals, rather flexible, slender; flower usually 7.5-8.5 cm. in diameter.

Rocky slopes in the Sonoran and Chihuahuan deserts and the lower part of the Desert Grassland at 2,000 to 4,000 feet elevation. Arizona from eastern Pinal County and eastern Pima County to the upper Gila River valley and the lower parts of Cochise County. This is the only Echinocereus in the desert about Tucson. Flowering in April and May. Closely related to var. boyce-thompsonii.

EXECUTIVE BOARD MEETING

The executive board of the Arizona Cactus and Native Flora Society met in Webster Auditorium of the Desert Botanical Garden at 8 p.m. on Monday, April 22nd, 1957. John H. Eversole, Chairman of the Board presiding.

A preliminary report of the year's finances was read (see editorial) by the President, who also reported continued increase in attendance at the garden, greatly increased plantings in the Garden and the very real need of an additional staff member made necessary by the increased attendance and enlarged plantings.

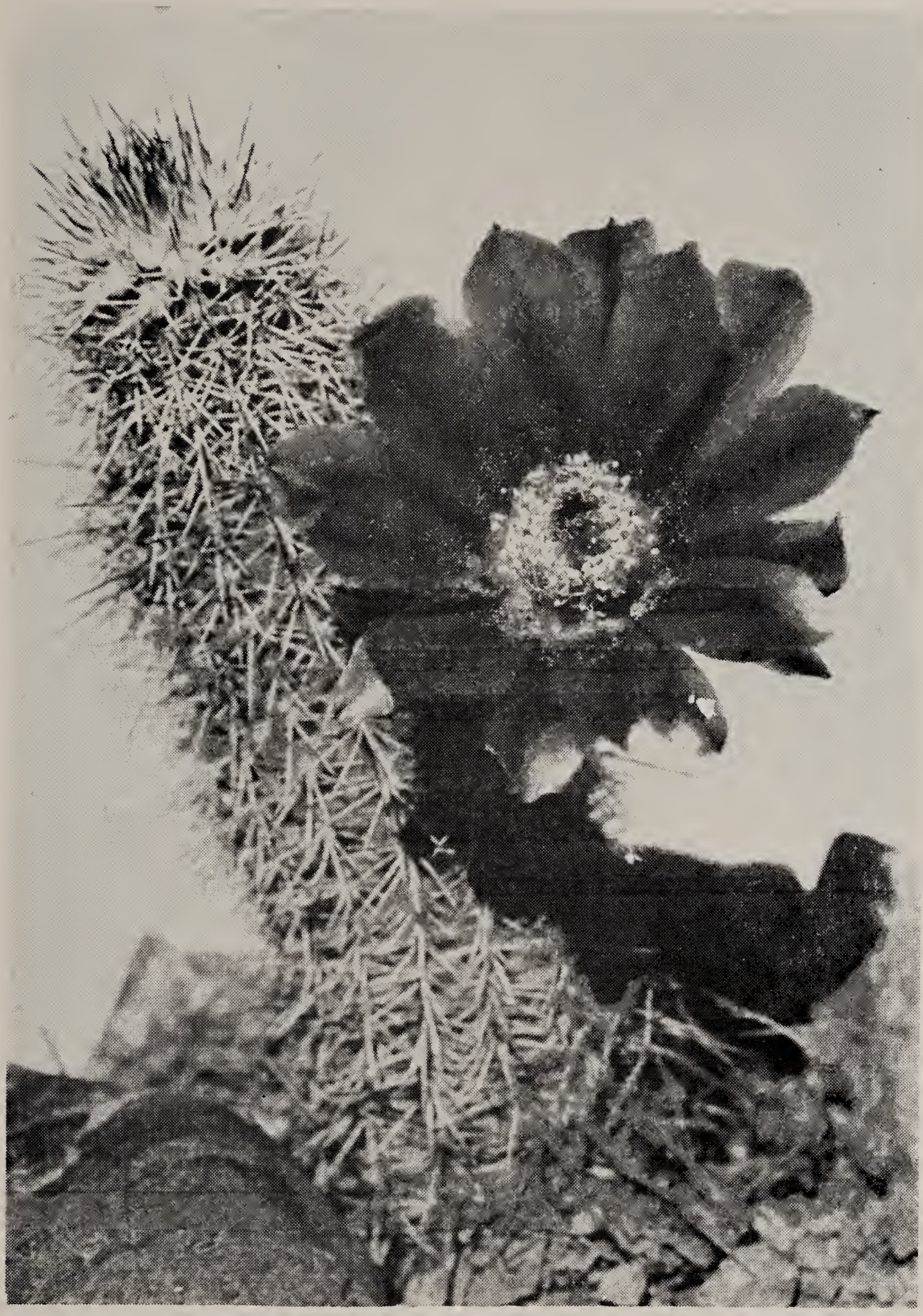
The need of additional endowment funds is obvious but this can be obtained only by bequests to the Garden either from living patrons or as benefactors by will and the process is necessarily slow.

A very considerable temporary relief could result from the erection of the proposed entrance building and new parking lots at the north end of the intensive plantings.

The building to contain the book store, additional rest rooms and office would be so constructed that all traffic into and out of the garden would pass through the store and this should result in a great increase in sales and profit for the support of the garden. Additional parking lots are now a serious need and no new parking can be developed in the area of the present lots but ample room is available adjacent to the proposed entrance building.

The cost of parking lots and building would be between $30,000 and $40,000 and income increase should approximate 5,000 annually, which should care for increased costs of operation for the next eight or ten years.

We have the prospect of getting a portion of the needed funds from one source but must devise ways of raising the additional funds from other benefactors.



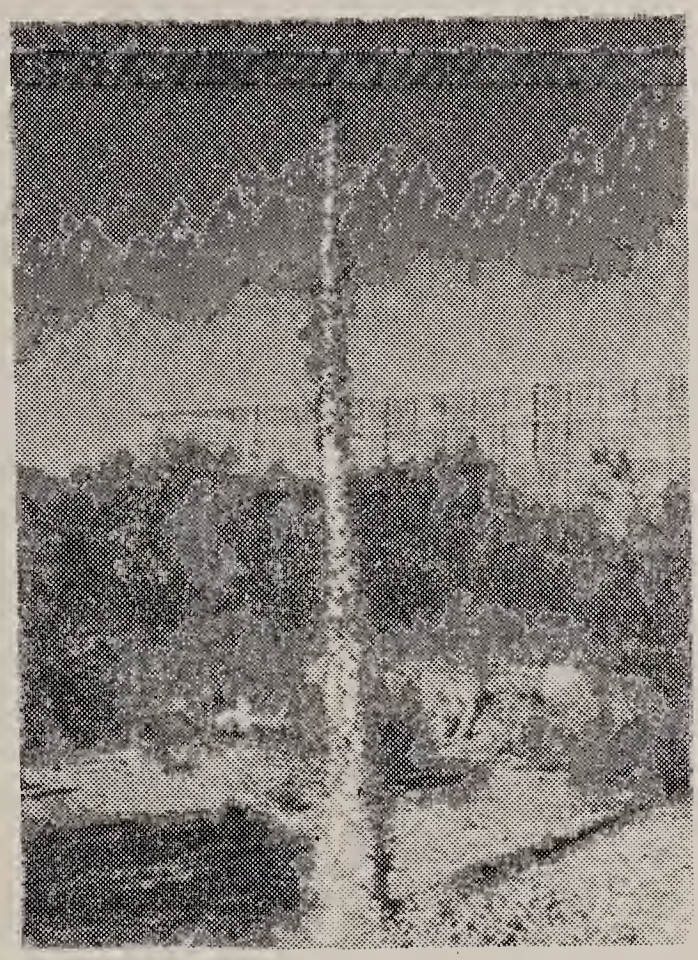
Echinocereus fendleri variety.
robustus (Peebles) Benson

Flower and fruit details of E. Fendleri Eng. as illustrated in the U. S.-Mexico Boundary Survey 1859.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

JUNE-JULY, 1957



Boojum Tree
Moulton Smith Photo

REG MANNING '57

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

Volume 11 JUNE-JULY, 1957 No. 6

Arizona Cactus and Native Flora Society

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Desert Botanical Garden of Arizona

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Superintendent ..... W. Hubert Earle
Assistant Horticulturist.....Demethic Vlachos
Research Associates .....Charles Mieg,
August Hermann, Sylvia Hermann

Garden Closed Until September 15th For Improvements

EDITORIAL

Financial Report for Fiscal Year Ending April 30th, 1957
Statement of Profit & Loss

INCOME		
Arizona's Cactuses — profits on wholesale sales		$ 268.99
Introduction to Desert Plants		172.37
Sales of Merchandise at retail		5,528.77
Total profits from sales		5,960.13
Income from Webster Endowment		10,901.79
Contributions		1,345.62
Memberships		2,033.50
Total Income for year		$20,251.04
EXPENSES		
Auto operation cost	$ 164.98	
Cactus Show expenses	213.16	
Insurance	656.25	
Utilities	714.43	
General Expense Account	2,865.79	
Salaries	13,352.00	
Bad Accounts	2.25	
Total Expenses	17,968.86	
Capital Expenditures		
Carport and Warehouse	1,450.00	
Fences & Gates on West line	1,164.84	
Furnishings	71.35	
Excess of expenditures over income		404.01
	$20,655.05	$20,655.05

From the above it will be noted that we had to draw $404.01 from our very slim reserve from last year leaving us less cash reserve this year than we had last year.

Our balance with the Valley National Bank is $1000 short of the balance of last May, 1956, so we will have to keep very strictly to our budget if we are to get through the incomeless summer months when expenses are highest because we have to have an extra man during that period.

Watering and moving plants, repainting woodwork on the buildings, repairing the black top on paths and extending our plantings make the extra man necessary so that the work goes on as our regular men get their well earned vacations.

Utilities and General Expenses rise in summer also as more water is used and hoses, tools and supplies need replacing and fertilizer and seed must be purchased.

This summer it will be necessary to print new editions of Arizona's Cactuses and Introduction to Desert Plants which will cost in excess of $2000. We also have to have another edition of 15,000 copies of our "Self Conducted Nature Walk" before we reopen for the fall season.

We will have an opening for a man on our permanent staff preferably with

some botanical education, to act as assistant horticulturist and as a guide when the garden is open for the fall season.

We prefer a young man who wants to get training in Desert Plant Life and is willing to start at $2400 a year with a $20 a month raise after the first four months of training and raises thereafter as earned — work schedule is 5½ days per week.

Applicants should apply by mail and give complete details of education and background in the first letter.

The Executive Board voted the first Honorary Founder Membership in our history to the Fishers for their generous contribution of plants and a lath house to us. The Fisher Collection is now installed in a portion of the grounds which had not been previously planted and it attracts very favorable attention.

Statement of Resources & Liabilities May 1st, 1957

RESOURCES		
Accounts receivable	$ 67.93	
Inventory — Arizona's Cactuses	200.64	
Intro. Desert lants	448.05	
Retail Merchandise	1,041.81	
Deposit with Industrial Commission	96.00	
Equipment	9,480.83	
Improvement (Bldgs, etc.)	48,000.00	
Cash		
Valley National Bank balance	5,519.68	
First Federal Sav. & Loan	400.00	
Petty Cash on hand	20.00	
LIABILITIES		
Reserve for Federal Tax withheld		97.61
Reserve for State Tax withheld		5.59
Net worth excluding plantings		65,171.74
	$65,274.94	$65,274.94

MEMBERS PRIVILEGES

We think that many of our members do not know that membership in the Garden entitles them to visit the garden, and bring friends with them, when the garden is closed to the general public.

Entrance is through the southwest gate which is marked as the residential entrance and you may come in the daytime or in the evening to see the night flowers.

Many very handsome flowers are seen in the summer months which do not flower earlier when we are open to the public. If you prefer you may phone in advance to make sure that flowers will be available on any given day or night.

Night flowers open shortly after dark and can also be seen in the early morning before 7:30 A.M.

We hope many of our local members will plan to visit the garden this summer and we again extend a cordial invitation to out of state members to visit us if you are in our vicinity this summer. This especially applies to those of our eastern members enroute to or from the Cactus Convention in Berkeley in July.

Another Gift to the Garden

Reg. Manning, Arizona's Pulitzer Prize Winning Cartoonist, whose cartoons, nationally syndicated, appear in newspapers all over the country is also a painter of no mean ability.

Mr. Manning was the first Chairman of the Board of our organization, a position he held for those first five difficult years after our reorganization.

His advice and assistance then was largely responsible for the measure of success our Garden has achieved.

Reg has done a number of paintings of desert scenes, some of which were exhibited in New York and earned him great praise. Included was a painting of the Purple Prickly Pear in our Garden.

Painted in the spring it shows the plant at the time of spring growth when the blue-purple, plate-like pads of old growth bear the smaller, deep maroon pads of new growth and the first of the lemon yellow flowers.

Reg has decided that this particular painting belongs in the Desert Botanisal Garden and he has presented it to us and we have given it a prominent place in Webster Auditorium so that our visitors can enjoy it.

Our very sincere thanks to Reg on behalf of the Executive Board, the Staff of the Garden and surely also of the public who will see it when they visit the garden.

BOOK REVIEW

"Native Plants for California Gardens," Lee W. Lenz — Rancho Santa Ana Botanic Garden, Claremont, Calif. 166 pages, cloth bound, 1 color plate and 100 half tone illustrations. $3.85 plus 15c for postage. Printed by Abby Garden Press.

101 species of plant native to California, and in many instances also to Arizona, are pictured and described and the best method of growing them in gardens in California, and equally in Arizona, are given based on experience gained by growing them at the Rancho Santa Ana Botanic Garden.

Some of the species described could not be successfully grown in Arizona but these can be identified by the extension notes on habitat, soil and average rainfall as indicated for almost all of the plants described.

The majority are usable, and a few of them were recommended by us in "Introduction to Desert Plants," for Arizona gardens and we suggest the use of this new book as supplemental to our book.

Our own horticulturist, Mr. Earle, has found a lot of information of value to him in the new book and he hopes that the cultural directions given for some of the species we have so far been unable to grow will now enable him to grow many of the plants with which we have had difficulties.

Our congratulations to Mr. Lenz and the Rancho Santa Ana Botanic Garden for a difficult job very well done.

Dictionary of Genera and Subgenera of Cactaceae from 1753 to 1956, R. S. Byles. National Cactus and Cucculent Society of England publication. 33 pages — $1.75 postpaid from Desert Botanical Garden.

The most valuable publication in recent years. All genera and subgenera in Cactaceae to Dec. 31, 1956 are listed and their legitimacy or illegitimacy indicated.

Not an attempt to dictate classification but an index to validly published genera and subgenera so that they can be accepted or rejected in any of the various systems of classification of plants in the Cactus family.

Old Man Cactus
Moulton Smith Photo

THE GENUS LOBIVIA

MRS. ISABELLE HOLT

The genus Lobivia was erected by Britton and Rose in "Cactaceae" III:49, 1922. The name is an anagram of Bolivia where many of these cacti are found. Of the 21 species listed in Britton and Rose only 16 are now retained. The 5 not retained have been referred to other genera: 2 to Acanthocalycium, 1 to Eriosyce, 1 to Weingartia, and 1 to Echinopsis. Backeberg, in his two books "Kaktus-ABC," 1935, and "Bulletin for Cactus Research" ("Blatter fur Kakteenforschung"), 1935, described many new species. He reclassified and added many more in his "Twenty Years of Cactus Research" which was published in the "Cactus and Succulent Journal" XXIII, No. 2, 1951. Buining, also, has classified several new species since 1950 in "Succulenta" (published in Holland). Others who have identified new species are Werdermann, Bodeker, and Wessner.

Lobivia, sub-tribe Echinocereanae, is very similar to other genera in that subtribe, such as Echinopsis and Rebutia. The intergrading of genera and divisions is, at most, arbitrary. Thus there are differences of opinion in the classication of many of these species. As a result, there has been considerable reclassification among the Lobivia, Rebutia, and Echinopsis by such authorities as: Backeberg, Berger, Castellanos, and Marshall. Another genus of Echinocereanae Acanthocalycium, was erected by Backeberg in 1935 because of the ring of wool inside the flower tube above the ovary. 2 Lobivias from Britton and Rose and 1 species of Echinocactus, and 6 other new species since Britton and Rose have been referred to

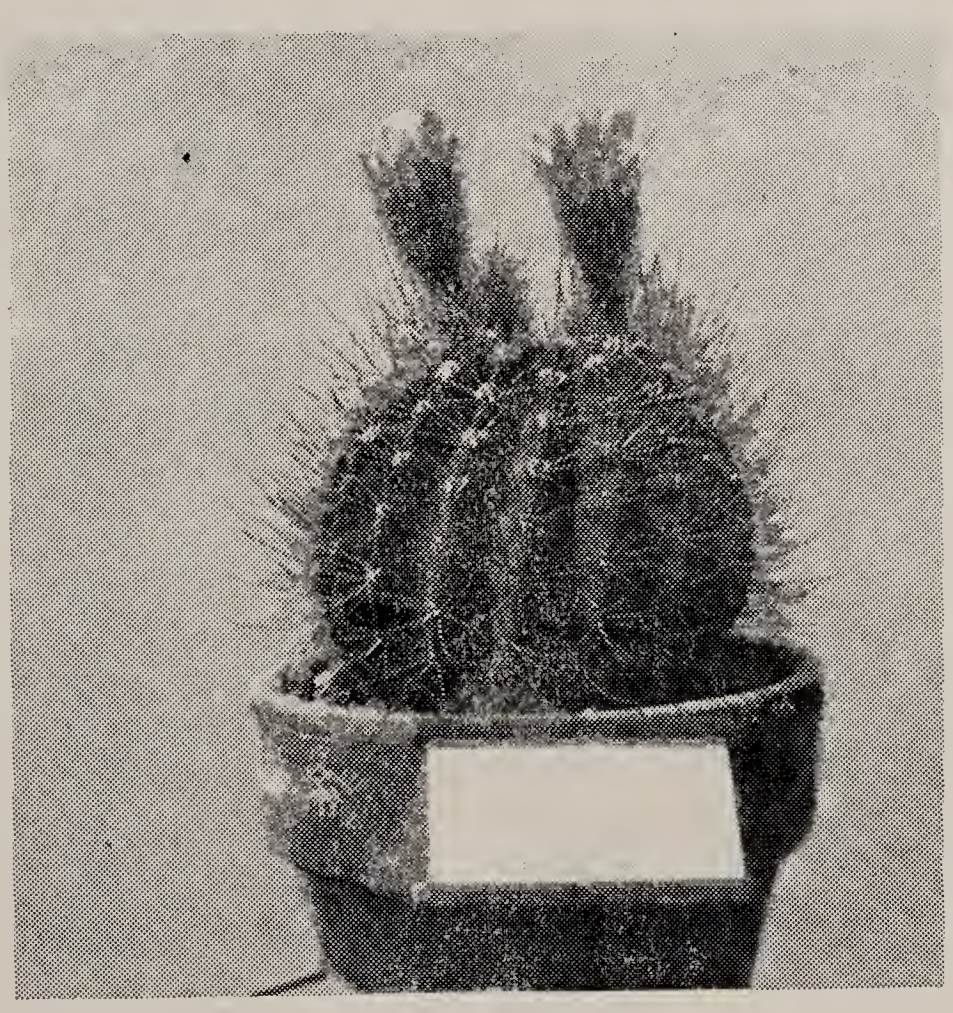
this genus. A fifth genus, Chamaecereus, consists of 1 species and is set apart because of its creeping tendency and small peanut size stems.

Closely related to the 5 above mentioned genera is one from another subtribe, Cereanae. This genus, Trichocereus, differs chiefly in its larger flower and heavier tube in the smaller, globose to short cylindrical species but also contains immense, tree-like forms which do not resemble Lobivia except in flower.

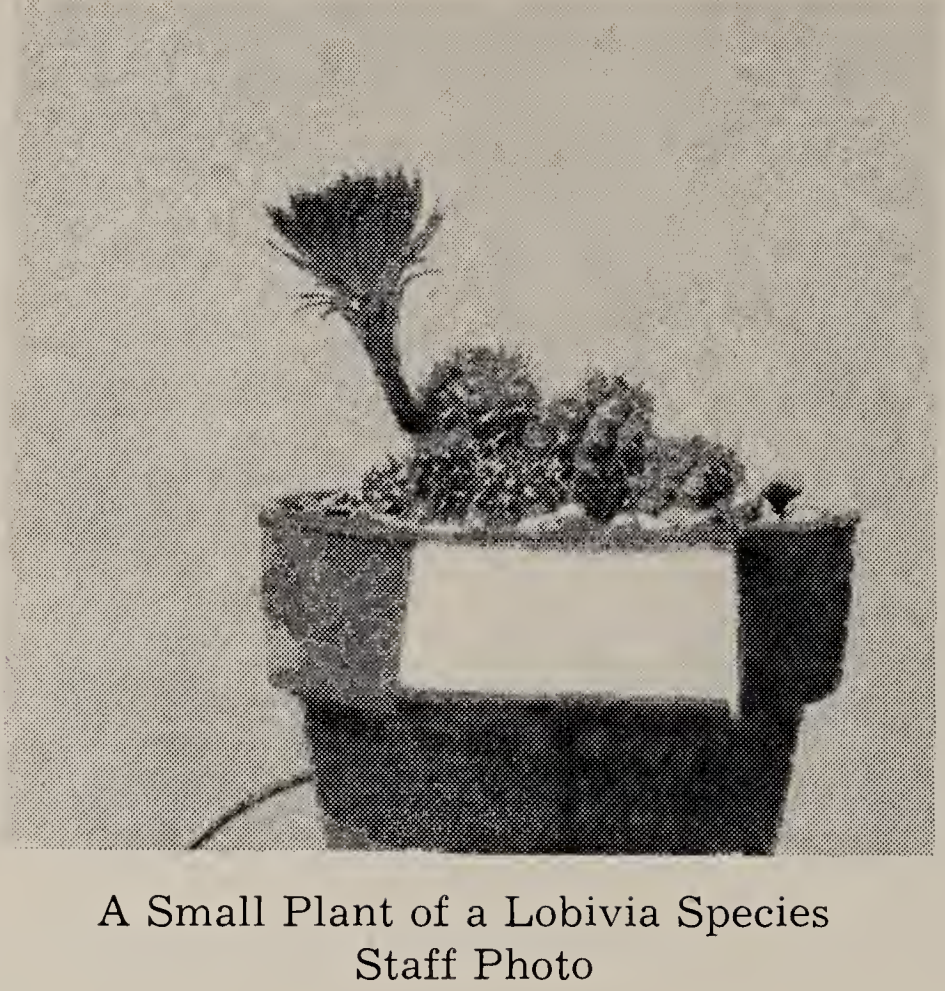
There are over 33 species and 10 varieties of Rebutia, 42 species and varieties plus hybrids of Echinopsis, 9 species of Acanthocalycium, 1 species of Chamaecereus, and about 100 species and 65 varieties of Lobivia — a total of over 185 species and 76 varieties plus hybrids from 5 of the 6 genera of Echinocereanae.

What is a Lobivia? It is a South American cactus of the sub-tribe Echinocereanae. It is usually small, though may be up to several feet tall as in Lob. huascha (Weber) Marshall (a beautiful specimen is now in flower in the Desert Botanical Garden). Lobivia is spherical or short-cylindric; single or caespitose; ribs with (usually) hatchet shaped tubercles; flower and spines from the same areole on ribs or tubercles; stems usually very spiny; the flower blooms by day and is funnel or bell shaped, with a short, broad tube; flower grows from lateral areole, or areole near top of stem as in Lob. caineana Cardenas; scales on ovary are not papery but have long hairs in their axils; flowers of many colors, usually red, yellow, or variations of red and yellow. There is one known white flower, with black throat: Lob. vatteri Krainz.

The distinguishing characteristics among these genera similar to Lobivia are: The Echinopsis flower has a long-



Acanthocalycium violaceum
Staff Photo



A Small Plant of a Lobivia Species
Staff Photo

er tube than Lobivia (may be up to 20 cm. long), is usually nocturnal and usually white, lavender tint, or pink tint. The Acanthocalycium flower is usually found at the top of the stem, growing from young areoles, and has a ring of wool inside the flower tube above the ovary; also has rigid, papery scales on flower parts. The flower of Rebutia is much smaller than that of Lobivia, but has, proportionally, a longer flower tube. The bloom grows from an areole near the base of the plant. Another outstanding individual character of Rebutia is that it is completely nippled instead of ribbed, the nipples spirally arranged.

Evolution is still in progress and some classifications will undoubtedly change. Consequently, a complete list of Lobivia is anything but static. The following list is offered as a **Working List:**

Many of the species listed have not been seen in the United States and of the species we have seen we feel that too much stress has been laid on flower color and many of the published names may be reduced to color variations as we know them better.

WORKING LIST

Lobivia allegraiana Bckbg., 1935.
L. andalgalensis (Web.) Br. & R.
L. arachnacantha Buining & Ritter.
L. argentea Bckbg., 1935.
L. aurea (Br. & R.) Bckbg., 1934.
Var. grandiflora Bckbg.
Var. elegans Bckbg.
Var. robustior Backbg.
L. backebergii (Werd.) Bckbg.
L. binghamiana Bckbg., 1935.
L. boliviensis Br. & R., 1922.
L. breviflora Bckbg., 1935.
L. caineana Cardenas.
L. cachensis (Speg.) Br. & R.
L. caespitosa (J. A. Purpus) Br. & R.
L. carminantha Bckbg., 1935.
L. chereauniana (Schlumberger) Bckbg.
L. chrysantha (Werd.) Bckbg.
Var. janseniana Bckbg.
Var. leucacantha Bckbg.
L. cinnabarina (Hooker) Br. & R.
L. claeysiana Bckbg., 1937.
L. cylindica Bckbg., 1935.
L. denispina Werd. 1934.
L. drijveriana Bckbg., 1933.

Var. astranthema Bckbg.
Var. aurantiaca Bckbg.
Var. nobilis Bckbg.

L. ducis-paulii (Fric) Foester.
L. emmae Bckbg.
Var. brevispina Bckbg.
L. famatimensis (Speg.) Br. & R.
Var. albiflora (Wessner) Bckbg.
Var. aurantiaca (Bckbg. ex Wessner) Bckbg.
Var cinnabarina (Bckbg. ex Wessner) Bckbg.
Var. haematantha (Bckbg. ex Wessner) Bckbg.
Var longispina Bckbg.
Var. nigricans Backbg.
Var. oligacantha Bckbg.
Var. rosiflora Bckbg.
Var. setosa Bckbg.

L. ferox Br. & R., 1922.
L. grandiflora Br. & R., 1922.
L. grandis Br. & R., 1922.
L. haageana Bckbg., 1933.
Var. albihepatica Bckbg.
Var. bicolor Bckbg.
Var. chrysantha Bckbg.
Var. cinnabarina Bckbg.
Var. durispina Bckbg.
Var. grandiflora-stellata Bckbg.
Var. leucoerythrantha Bckbg..
L. haematacanthus Hosseus.
L. haematantha (Speg.) Br. & R.
L. hastifera Werd., 1939.
L. hermanniana Bckbg., 1935.
L. hertrichiana Bckbg., 1933.
L. higginsiana Bckbg., 1933.
L. hossei (Werd.) Bckbg., 1931.
L. huascha (Weber) Marshall, 1893.
Var. rubra.
L. hyalacantha Speg.
L. incaica Bckbg., 1935.
L. iridescens Bckbg., 1935.
L. jajoiana Bckbg., 1933.
Var. fleischeriana Bckbg.
L. johnsoniana Bckbg., 1935.
L. klimpeliana (Weidl. & Werd.) Berger.
L. kermasina (Pseudolobivia).
L. kupperiana Bckbg., 1935.
L. lateritia (Gurke) Br. & R.
L. leuocomalla Wessn., 1938.
L. leucorhodon Bckbg., 1935.
L. leucoviolacea Bckbg., 1935.
L. marsoneri (Werd.) Bckbg.
L. mistiensis (Werd. & Bckbg.) Bckbg.
Var. brevispina Bckbg.
Var. leucantha Bckbg.
L. nealeana Bckbg., 1934.
L. nigrispina Bckbg., 1935.
L. nigrostoma Buining.
L. oreopogon Speg.
L. pampana Br. & R., 1922.
L. planiceps Bckbg., 1935.
L. polaskiana Bckbg.
L. pentlandii (Hooker) Br. & R.
Var. achatina Bckbg.
Var. albiflora Bckbg.
Var. atrocarnea Bckbg.
Var. castanea
Var. cavendishii Bckbg.
Var. colmarii Bckbg.
Var. elegans Bckbg.
Var. leucantha Bckbg.
Var. longispina Bckbg.
Var. maximiliana (Heyd.) Bckbg.
Var. ochroleuca Bckbg.
Var. scheeri Bckbg.
L. polycephala Bckbg., 1935.
L. potosina Werd.
L. pseudocachensis Bckbg., 1934.
Var. cinnabarina Bckbg.
Var. sanguinea Bckbg.
L. pugionacantha (Rose & Boed.) Bckbg.
L. raphidacantha Bckbg., 1935.
L. rebutoides Bckbg., 1934.
Var. citriniflora Bckbg.
Var. kraussiana Bckbg.
L. ritteri Wessn., 1938.
L. rossei Boed., 1933.
Var. boedekeriana (Harden) Bckbg.
Var. hardeniana (Boed.) Bckbg.
Var. stollenwerkiana (Boed.) Bckbg.
L. rubescens Bckbg., 1933.
L. saltensis (Speg.) Br. & R.
L. sanguiniflora Bckbg., 1935.
L. schneideriana Bckbg.
Var. cuprea Bckbg.
L. schreiteri (Werd.) Castell., 1930.

L. shaferi Br. & R., 1922.
L. scoparia Werd., 1939.
L. stilowiana Bckbg.
L. sublimiflora Bckbg. ex Wessner, 1935.
L. tegeleriana Bckbg. (Acantholobivia)
Var. eckardtiana
Var. medingiana.
Var. plominiana.
L. uitewaaleana Buining.
L. varians Bckbg., 1935.
Var. croceantha Bckbg.
L. vatteri Krainz.
L. violacea Werd.
L. walterspielii Boed.
L. westii P. C. Hutchinson.
L. wegheiana Bckbg.
Var. brevispina Bckbg.
Var. leucantha Bckbg.
L. wrightiana Bckbg.

Mediolobivia intermediate between Lobivia and Rebutia.

M. atrovirens Backbg. 1935.
M. aureiflora Backbg.
var. albiseta.
var. brevispina.
var. brunnispina.
var. lilacinostoma.
var. leucolutea.
var. variegata.
M. boedekeriana Backbg. 1956.
M. digitiformis Backbg. 1935.
M. durrsmaiana Backbg.
M. elegans Backbg.
var. gracilis Backbg.
M. euanthema Backbg. 1934.
M. eucaliptama Backbg. 1935.
M. kesselringiana Cullman.
M. longiseta Backbg. 1956.
Var. albilongiseta Backbg.
M. haagei (Fric) Backbg.
Var. flavovirens Backbg.
M. orurensis Backbg. 1935.
M. pectinata Backbg. 1935.
M. pygmaea Backbg.
Var. longispina Backbg.
M, rubelliflora Backbg.
M. rubiflora Backbg.
M. sarothroides (Werd.) Buin.
M. steinmannii (Solms-Laub.) Backbg.

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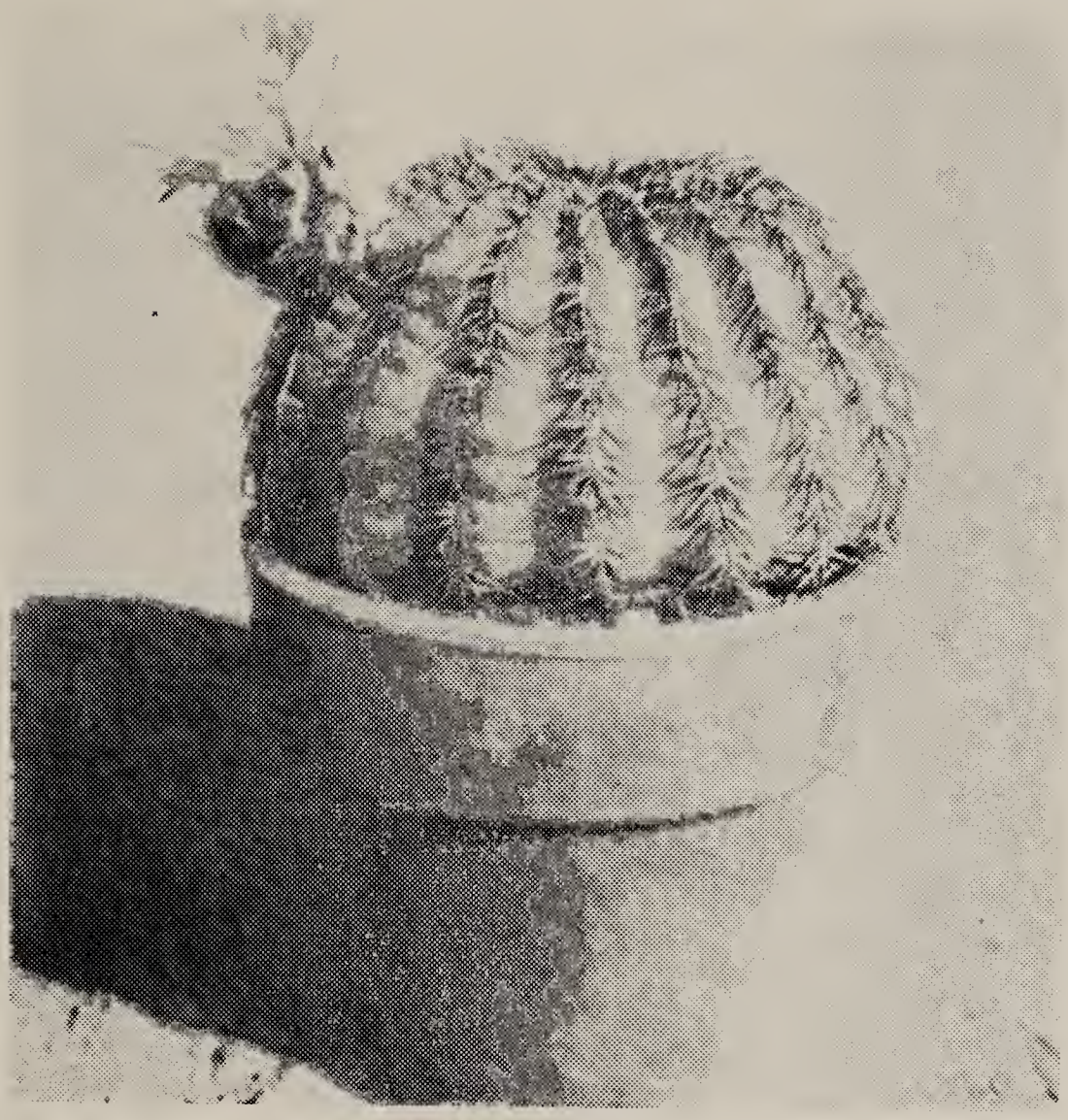

Echinocereus pulchellus
var. amoenus

Echinomastus johnsonii
var. lulescens

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

AUGUST-SEPTEMBER, 1957

Pediocactus simpsonii; an intergrade between varieties minor and robustior.

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

Volume 11 AUGUST-SEPTEMBER, 1957 No. 7

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10:00 A.M. to 4:45 P.M. Closed Mondays.

EDITORIAL

Saguaroland Bulletin, in common with almost all of the smaller publications is faced with a financial problem due to the ever increasing cost of paper and printing.

Right now our cost for paper and printing is .14c per copy plus .02c postage (which may be increased) and .03c each for addressing and placing in envelopes. In addition to this direct cost we have a considerable overhead for keeping track of our members and for postage on our notices to our members of the expiration of their subscriptions and .05c postage on each remittance received from our members in our self-addressed envelopes.

As we send out ten copies of the Bulletin annually, this represents a direct cost of $1.90 per year plus the time of the writers of the articles, the writing of them by our stenographer, and proof reading, so that from each of the $3.00 memberships actually only about .10c per year is left for the support of the Garden.

Within the past few months memberships have been increased by all of the organizations of similar nature to which we subscribe and we feel that we also will be compelled to somewhat increase our subscription rates. Therefore we have prepared for consideration of the Executive Board, an amendment to our by-laws which will make the Builder membership at $5.00 per year our lowest membership for new subscriptions. Within the last year about 50 per cent of our $3.00 members have voluntarily increased their membership into the $5.00 class and the remaining 50 per cent, we feel, represent people of good will who desire to support the Garden but just can't afford more than the $3.00 they're now paying.

The proposal for amendment of by-laws will be presented to the Executive Board at its October meeting, and if acted upon favorably by them, it will have to be voted on by the entire membership, with a 2/3 majority in favor, necessary to put the change into effect. To get a line on the reaction to this proposal we are going to list $5.00 as our lowest rate of membership for new subscribers while retaining the $3.00 rate for the present subscribers who are still paying only the $3.00. Should the amendment carry, it will be provided that all of those members who now pay the $3.00 may continue to do so as long as they keep that membership paid up. However, should a $3.00 member allow his membership to go beyond thirty days over due, that membership is cancelled under the existing by-laws and renewal after thirty days beyond the expiration date constitutes a new membership which would be at the $5.00 rate. As we do not wish to lose any of our valuable memberships we shall put the new price plan into effect immediately on a voluntary basis, which means that we will still have to give membership at the $3.00 rate if that is insisted on, until such time as the amendment to the by-laws is ratified by a 2/3 vote by the entire membership. Meanwhile we would deeply appreciate your views on this matter for our guidance.

Isabelle Holt, whose article on Lobivias appeared in our last issue, returns with a similar article and check list on the genus Rebutia in this issue. She is a graduate of the University of Chicago from whom she received a degree, Ph. B., later doing graduate work at the University of Virginia and at the University of Arizona where she also taught for one summer semester.

She was fortunate in having as one of her instructors at the University of Chicago, the eminent botanist Dr. John Coulter. At this time she holds a certificate as teacher in Arizona and does

some substitute teaching. She is also a member of the evening class in taxonomy in the Garden.

Mrs. Holt is the happy mother of two children, both of them sons and both of them in Medical school.

The opinions in these articles are her own obtained by painstaking research and uncensored by us.

With all but the most minor statements, we are in complete accord.

The Garden is assembling a considerable amount of material for further study in this Lobivia-Rebutia group; but pending completion of these studies we accept as valid, the genera Lobivia, Rebutia, Acanthocalycium and tentatively the genus Mediolobivia.

We believe that on completion of our study, many of the species now listed can be reduced to synonomy and that most of the varietal separations are unnecessary as based on natural differences to be found in field work in all species of plant life.

Meanwhile the check list should prove very helpful to the great number of members who have recently developed an interest in these small but colorful plants.

MORE ABOUT ECHINOMASTUS

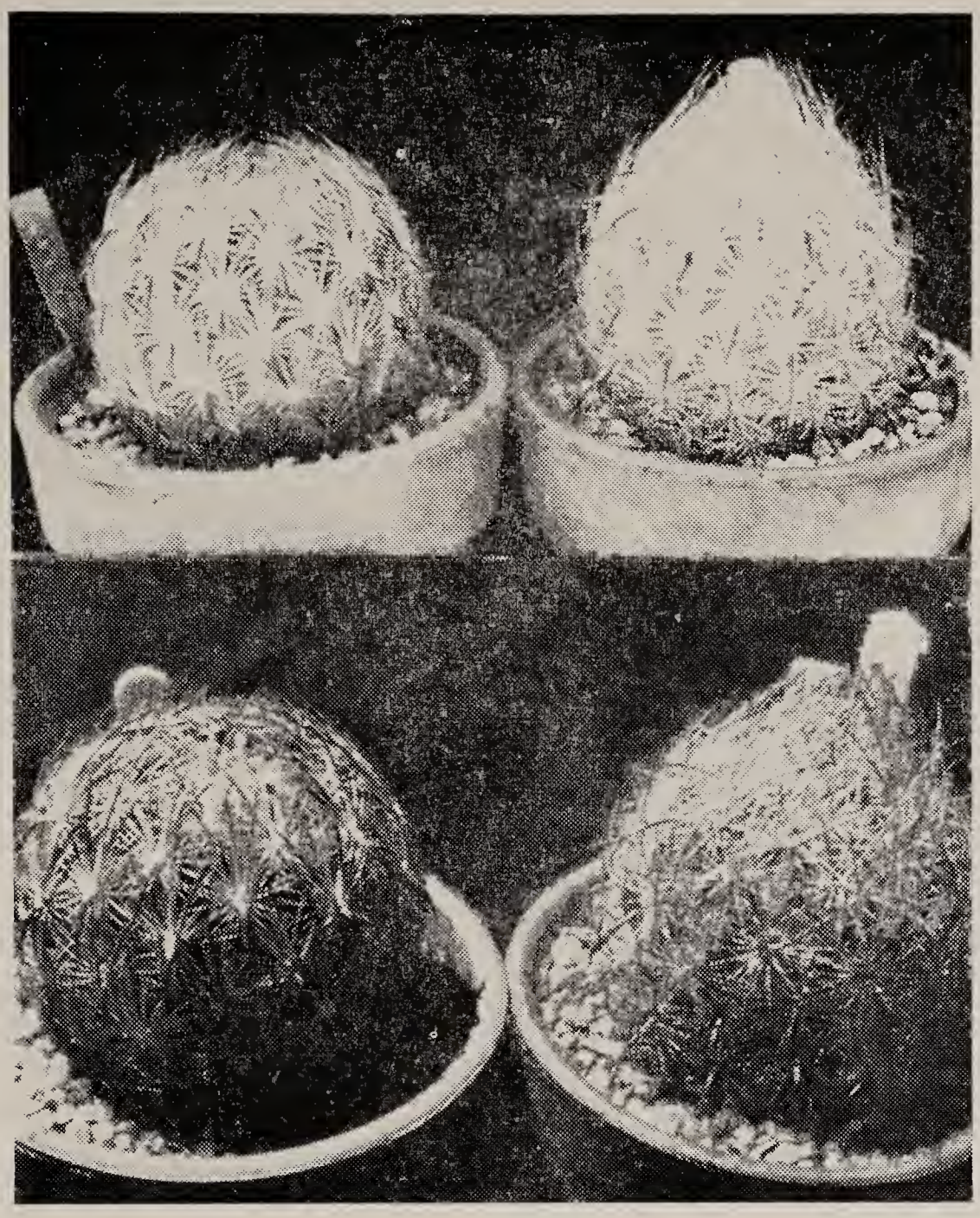
In the April, 1957 issue of Saguaroland Bulletin, the statement was made in the last paragraph of the article that Echinomastus unguispinus, the clawed hedgehog breast, is very scarce.

The writer has not seen an authentic specimen since a plant sent by Dr. Lowrey over twenty years ago.

By a peculiar coincidence two plants have come to my attention within a week. The first example having been brought in to us by Mr. Manuel Diaz who has just returned from a two weeks trip which he and Mrs. Diaz made into Mexico

While there Mr. Diaz traveled over a new road, which has been graded but not paved, in the state of Durango, where he located a hill densely covered with the species. The plant he brought us is shown to the left in the picture which accompanies this article and it is typical of the species. You will note that the central spines are arranged exactly like the talons of a bird of prey, and as they are almost black they stand out against the lighter colored radial spines.

The plant illustrated by Britton and Rose in Cactaceae III, 148 is not E. unguispinus but represents a species that was undescribed until 1953 when Curt Backeberg in the Cactus and Succulent Journal of Great Britain vol. XV, July 1953 described it under the name Echinomastus mapimiensis. Backeberg's description of the plant indicates it is usually simple about 4 in. high and 3 in. in diameter with 13 ribs formed of confluent nipples which are grooved on the upper surface and gray-green in color. Radial spines, about 22, whitish and 4/5 in. long. The upper spines longer than the lower, strongly ap-



Two pictures with different lighting to show the contrasting spines. Left: Echinomastus unguispinus. Right: E. mapimiensis.

pressed and interlaced. Central spines usually 4 of which 3 are somewhat curved and directed upward, whitish with brown tips something over an inch long, the other somewhat bent downward about half as long as the upper and light brown in color. Flowers, less than an inch wide, dirty white with tan midstripe on the petals; the style, pale green with numerous yellowish stigma-lobes; anthers, cream colored, the filaments greenish.

This plant has been collected many times, both by the garden and dealers, but the dealers have usually sent it out as E. unguispinus. Mr. Diaz also brought specimens of this species, one of which is shown in our illustration to the right.

The second occasion of the coincidence occurred in an assortment of herbarium sheets sent to us for possible identification by the Fuaux Herbarium in Australia. One sheet containing two spine clusters of what seems to be E. ungui-

spinus but which was received by them from a dealer in Mexico under the name of Thelocactus conothelos and the second sheet with three spine clusters also probably E. unguispinus and received from them in 1956 under that name.

These coincidences provide factual proof of the true identity of a species which has been in doubt for many years.

PEDIOCACTUS IN ARIZONA

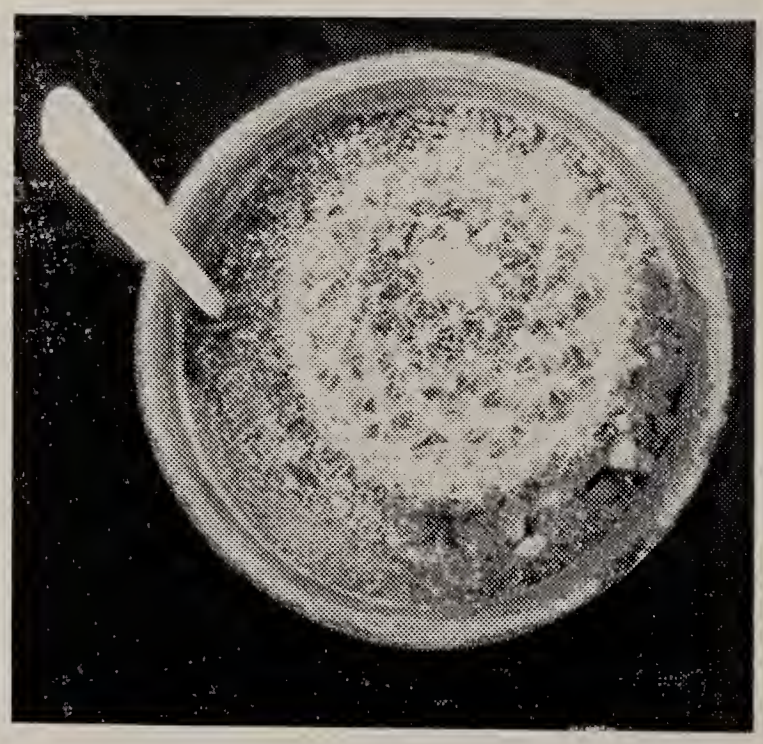
Pediocactus simpsonii; variety robustior.

PEDIOCACTUS Britton and Rose in Britton and Brown, Illustr. Fl. ed. 2.2: 569. 1913.

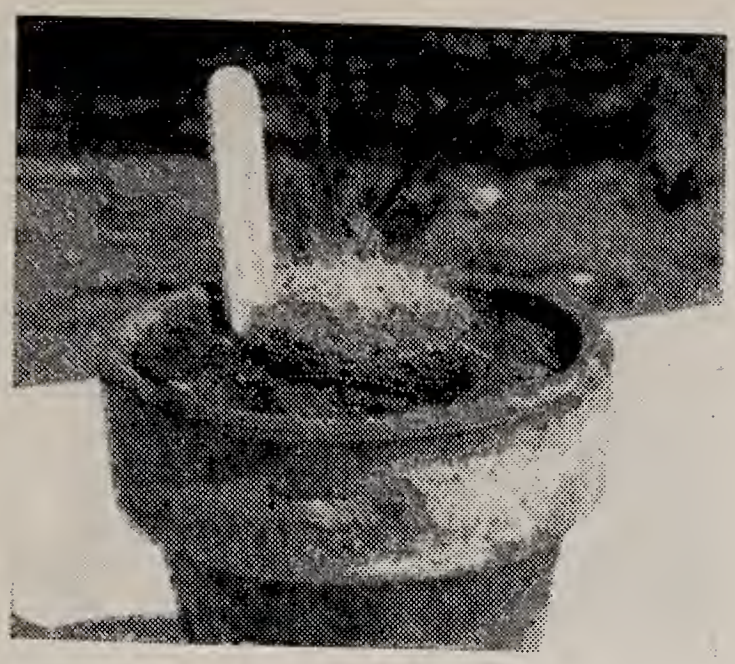
Globular, single or cespitose, small, strongly tubercled cacti; tubercles borne on spiraled ribs; young areoles very wooly, but in age nearly naked; flowers small, with a rather indefinite funnel-shaped tube, pinkish, broadly campanulate; outer perianth-segments smaller than the inner and duller in color; inner perianth-segments oblong, numerous; scales on flower-tube few, naked in their axils; stamens numerous; ovary green, nearly globular, with a few scales towards the top, and a depressed scar at apex; fruit dry, greenish, splitting on the side; seeds dull black, tuberculate, keeled on the back with a large sub-basal hilum.

Type species: Echinocactus simpsonii Engelmann.

The plant has been described both as Mammillaria and as Echinocactus. In its globular shape and strongly tubercled surface it resembles very much many of the so-called Mammillarias, but the tubercles are really borne on ribs, while the flowers are borne near the center



Pediocactus simpsonii; variety hermannii.



Side view of the new Pediocactus from Monument Valley.

of the plant and originate just above the spines; therefore, this genus belongs to Echinocactus rather than to the Coryphanthanae; the seeds are unlike those of Coryphanthanae.

Distribution: Kansas to New Mexico, north to Nevada, Washington, Idaho, and Montana. The Arizona plants in this genus are to be referred to:

PEDIOCACTUS simpsonii (Englemann) Britton and Rose variety minor (Engelmann) Boissevain and Davidson. Colorado Cacti 1940. With smaller tubercles in 8/21 or 13/34, or even 21/54 order, closely set, bearing smaller but often more numerous spines (20-28 external, 6-7 internal), may be confounded with the simple mountain form of M. vivipara, from which, when not in flower or fruit, only a close examination can distinguish it.

Type locality: Near Mount Vernon, Colorado.

Distribution: Colorado, Wyoming, New Mexico and Utah. It is also found in House Rock Valley, Arizona.

Variety minor covers the most extensive range and is the plant usually found in collections. It ranges from 3,000 feet to almost 12,000 feet and is very variable as to spine color as pure white spines are found on many plants but straw yellow or reddish brown spines are found on plants in the same colonies.

The Arizona specimens we refer here were collected by Mr. and Mrs. Gus. Hermann in the summer of 1956 in the northern portion of House Rock Valley.

Two or three months prior to the Hermann's find a Mr. Paradine found several plants which may be referable here even tho the spines are much longer and more hair like. We have not had an opportunity to critically study Paradine's plants but we are informed that material for study of them has been sent to Dr. Lyman Benson at Claremont College, California.

PEDIOCACTUS simpsonii (Engelmann) Britton and Rose variety hermannii (Marshall) comb. Nov.

Pediocactus hermannii Marshall, Saguaroland Bulletin VIII: 78. 1954.

Plant body simple globose, 6.5 cm. in diameter with a tubernate base, 3-5 cm. high, glaucous green but pinkish at base of tubercles, clearly visible through the few spines.

Tubercles in 8/13 spiralled rows, conical but slightly flattened vertically when young and laterally flattened in age, 1 cm. high.

Areoles small, circular or slightly elongated, at first white villose but naked in age.

Central spines 3 to 5, if 4 then in cruciform arrangement if 5, divergently spreading, acicular, about 1 cm. long, dark brownish-red.

Radial spines 14-16, flatly spreading almost hair-like, white.

Flowers from the spine bearing areoles of nascent tubercles, buds, globose, covered by imbricated triangular scales, the axils without spine or felt. Flowers 2-2½ cm. long, 2 cm. in diameter campanulate, white or rarely pale pink.

Outer perianth segments spatulate, obtuse, white with olive-green midrib on outer surface, white within.

Top view of the new Arizona Pediocactus.

Inner perianth segments oblanceolate, apiculate, white.

Filaments numerous, creamy-yellow, stamens included.

Anthers small, round, golden-yellow.

Style pale green. Pistil included.

Stigma lobes about 8, short, pale green.

Fruit at first bearing persistent perianth, green, naked, but perianth abscises as fruit ripens leaving apex of fruit truncate at first but rapidly depressing to form an umbillicate top with ridges. Fruit then becomes pinkish and dehiscesses by splitting. The dry fruit then separates leaving a basal opening and a large scar persists on the tubercle. The fruit is 8 mm. in diameter and 8 mm. in height.

Seeds obovate-oblique, keeled, dull black, minutely tuberculate, hilum subbasal, large.

Type locality: Garfield County, Utah, at 6,200 feet.

Distribution: Known only from type locality.

When this plant was first described it semed distinct but we have since found much intergradation with the variety minor for which reason we have reduced the species to a variety.

The fruit characters as described for variety hermannii are found in all of the varieties of Pediocactus simpsonii.

A fourth variety, robustior, is found in Idaho, and western Washington. In this variety the individual heads are much larger and they are strongly inclined to cluster forming mounds from one to two feet in diameter and the spines are pure black.

WHAT ARE WEEDS?

During the latter part of the spring season, the writer overheard one of those old-time Arizonans point out to his friends a plant of the four-winged salt bush in our Garden with the remark that he couldn't understand why a weed should be allowed to grow in a garden such as ours. This led me to look up the definition of a weed, and I find that the best definition, is that of the Department of Agriculture of the United States, who state that a weed "is a plant out of place." Therefore the plant our friend pointed out was not a weed because our Garden represents the vegetation of the desert in general and this four-winged salt bush and the twenty-one other varieties of the salt bush, when in its natural habitat, is not only not a weed, but a group of very valuable browse plants.

Without the salt bush the Navajo Indians would not be able to derive a living from the very arid land that our generous government has granted to them as a reservation in exchange for the valuable lands taken from the tribe.

The four-winged salt bush (Atriplex canescens) and the White thistle salt bush (Atriplex lentiformis) and a number of species of the salt bushes provide

A female plant of the silvery-leaved Atriplex hymenelytra.
The Desert holly.

the major food for both cattle and sheep in areas of the state where little else in suitable food is available.

Now, since the growing of sheep for the wool, to be used in the manufacture of Indian rugs and blankets, as well as for a meat supply for their own use and for sale, is a major part of the domestic economy of the Navajos; you can see the salt bushes are indeed important to them as they are to other cattlemen and sheepmen of the dryer districts.

The White thistle salt bush is the largest and the showiest, reaching a height of ten feet under favorable conditions. It makes a well rounded shrub, very silvery in color and actually attractive as an ornamental in the gardens of native plants now becoming so popular in the outskirts of Phoenix, Tucson, and other cities of Arizona, California, and New Mexico.

Another salt bush known as the Desert holly (Atriplex hymenelytra) is found in the Mojave Desert of California, and Arizona, and the silvery evergreen leaves, shaped like those of the holly or some of the oaks, and bearing numerous brightly red fruits around Christmas time, is greatly appreciated for use

in the making of Christmas wreaths, although the collection of branches is highly prohibited by law in both states.

It can be grown from seed, however, as we have done. And when so grown in a Garden it is a source of most attractive plant material for use during the Christmas season.

The accompanying picture shows one of the salt bushes as grown in nature or in our Garden and should prove a clear demonstration of the fact that the salt bushes should never be ranked as weeds.

One species of the Atriplex, the Australian salt bush, was introduced into the United States and has become very prolific. The low plants help to bind the soil along irrigation ditches and furnish forage for domestic animals, particularly sheep; and this species alone might be classed as a weed in the sense that it is out of place from its native Australian habitat. All of the salt bushes prefer alkaline soil and if given loose well drained soil with high alkaline content the seeds germinate easily and once established require little or no water.

THE GENUS REBUTIA

The genus Rebutia was erected by Schumann in 1895, and named for P. Rebut, a cactus dealer. Five species, and a possible sixth, were listed by Britton and Rose in "Cactaceae," 1922. The type species is Rebutia minuscula Schumann. Since the majority of the Rebutia were discovered in North Argentina after 1923, they are not listed in Britton and Rose. Of the more than thirty species much confusion exists as to their exact nomenclature. Authorities differ because of the intergrading among Rebutia, Lobivia, Mediolobivia, and Aylostera.

The Rebutia are small globose to cylindrical plants usually forming groups of several to many heads; definite ribs lacking; aeroles surmounting small tubercles; flowers arising from the base or side of the plant are small, red, orange, or yellow, and funnel-shaped; in some species the pistil is enlarged to completely fill the tube; ovary bearing small scales which are without content in some species but bear hairs in their axils in other species; fruit small, red, bearing scales which sometimes subtend hairs.

Some authorities have set up a new genus, Aylostera, to include the seven species of Rebutia which have an enlarged pistil filling the tube. Another new genus is Mediolobivia, proposed by Backeberg in 1934 to include those cacti with intermediate characteristics between Rebutia and Lobivia. These two new genera have been effectively and validly published and are considered legitimate in Byles' "Dictionary of Genera and Sub-genera of the Cactaceae," 1957. The type plant for Aylostera is Rebutia pseudominuscula Speg., and for Mediolobivia is Rebutia aureiflora Bckbg.

Other genera and sub-genera have been proposed over the past twenty years to aid in classifying these small

plants. Backeberg in 1934 created a sub-genus of Mediolobivia and named it Pygmaeolobivia. Buining, Fric, and Kreuzinger in 1940 proposed a new genus, Digitorebutia. The type plant listed in each case is Rebutia haagei Fric and Schelle. Small wonder those not authorities find confusion in labeling their plants.

The distinguishing characteristics considered in separating these cacti into various sub-genera or genera seem to be:

1. Relation of style and filaments to the filament wall
   In Aylostera they fill the tube; in Mediolobivia and Rebutia they are quite free from the receptacle wall; in Pygmaeolobivia (or Digitorebutia) they are constricted by a thickening of the wall above the base.
2. Presence of hairs on axils of receptacle scales
   In Aylostera the scales are spiny but with very few bristly hairs; in Mediolobivia there are some hairs and a few bristles; in Rebutia the receptacle scales are usually naked; in Pygmaeolobivia (or Digitorebutia) there are long white or brown wooly hairs.
3. Variations in size and shape of seeds.

This year in the March issue of "The National and Succulent Journal," printed in England, Donald proposes a new Sub-tribe Rebutinae of the Tribe Cereeae for the genera Rebutia, Aylostera, Mediolobivia, Digitorebutia, and Cylindrorebutia. If this new sub-tribe should be accepted as legitimate, what would be the relationship of the Genus Lobivia?

As an example of the differences in opinion among authorities on the nomenclature of cacti, here is a case history of Rebutia haagei: This small plant growing on the slopes of northern Argentina was first named Echinocactus haagei, an horticultural name. Fric and Schelle named it Rebulobivia haagei. In 1930 it was labelled Rebutia haagei by Fric and Schelle, and in 1934 Backeberg listed it as Lobivia neohaageana as a type plant of his new Sub-genus Pygmaeolobivia. The next year it was listed as a type plant by Fric and Kreuzinger for their new Genus Rebulobivia. Again it was a type plant for the new Genus Digitorebutia proposed by Buining, Fric, and Kreuzinger in 1940. Marshall in 1941 referred to this plant as Rebutia haagei. In 1942 Backeberg placed it in his Genus Mediolobivia, Sub-genus Pygmaeolobivia. Buining in "Succulenta" listed it as Rebutia haagei in 1950. Finally, in 1957, we find it in Donald's list as Digitorebutia haagei. What should be its name? We will label it Mediolobivia haagei, since it seems to be a species on the borderline between Lobivia and Rebutia. (This is a species distinct from Lobivia haageana Bckbg. 1933).

In the interests of clarification and less hair-splitting, we follow the authority of Marshall and consider the following as Genera: Lobivia, Rebutia, Mediolobivia, and Aylostera; as a Subgenus of Lobivia; Pygmaeolobivia. The Working Lists that follow were formed from sources listed in the bibliography. Sub-genera are not indicated for each species, as this varies according to the authority followed. Each species, unless noted, appears on one list only, regardless of its few or many synonyms. Lobivia and Mediolobivia Working Lists appeared in the preceding issue of this publication.

—ISABELLE HOLT.

WORKING LIST OF REBUTIA

Rebutia arenacea Cardenas
R. calliantha Bewerunge
R. carminea Buining
R. chrysacantha Bckbg.
R. costata Bckbg.
R. einsteinii Fric
R. glomeriseta Card.

R. grandiflora Bckbg.
R. knuthiana Bckbg.
R. krainziana Kesselring (R. turbinata
Var. cristata (hort.)
Var. aurescens Bckbg.
Var. breviseta Bckbg.
R. minuscula Schum.
Var. aurea (hort.)
Schuldt hort.)
R. marsoneri Werdermann
Var. iseliniana Krainz
R. schmiedickeana Kohler
R. senilis Bckbg.
Var. kesselringiana Bew.
Var. lilacino-rosea. Bckbg.
Var. schieliana Bew. nom, nud.
Var. semperflorens Poindexter
Var. stuemeriana Bckbg.
R. sieperdaiana Buining
R. steinbachii Werd.
R. violaciflora Bckbg.
Var. luteispina Bckbg. nom. nud.
R. waltheriana Bckbg.
R. wessneriana Bew. (R. senilis Var. hyalacantha Bckbg.)
R. xanthocarpa Bckbg.
Var. citricarpa Bckbg. (R_ citricarpa Fric)
Var. dasyphrissa Bckbg. (R. coerulescens Bckbg.)
Var. elegans Bckbg.
Var. luteirosa Bckbg. (R. xanthocarpa Var. pallidor Bckbg.)
Var. salmonea Bckbg. (R. salmonea Fric)

AYLOSTERA

Aylostera deminuta (Web.) Bckbg. 1935 (Rebutia deminuta (Gurke) Bckbg.)
A. fiebrigii (Gurke) Bckbg. 1935 (R. fiebrigii (Gurke) Br. & R.)
A. kupperiana (Boed.) Bckbg. 1935 (R. kupperiana Boed.)
A. pseudodeminuta (Bckbg.) B c k b g. 1935 (R. pseudodeminuta Bckbg.)
Var. albiseta Bckbg.
Var. grandiflora Bckbg.
Var. schneideriana Bckbg.
Var. schumanniana B c k b g. (R. schumanniana Bckbg.)
A. pseudominuscula (Speg.) Bckbg. (R. pseudominuscula (Speg.) Br. & R.)
A. spegazziniana (Bckbg.) Bckbg. 1935 (R. pectinata Fric nom. nud.)
Var. atrovirens Bckbg.
A. spinosissima (Bckbg.) Bckbg. 1935 (R. spinosissma Bckbg.)
Var. brunispina Bckbg.

ACANTHOCALYCIUM

Acanthocalycium chionanthum (Speg.) Bckbg. 1935 (Lob. chionanuthus (Speg.) Br. & R.)
A. formosum (Pfeiff.) Bckbg. 1935 (Etus. formosus Pfeiff.)
A. hyalacanthum (Speg.) Bckbg. 1935 (Lob. hyalacantha Speg. 1925, Echinopsis Werd.)
A. klimpelianum (Weidl. & Werd.) Bckbg. 1935 (Eps. Weidl. & Werd. 1928 Lob. Berger)
A. oreopogon (Speg.) Bckbg. 1935 (Lob. Speg. 1925, Eps. Werd.)
A. peitscherianum Bckbg. 1935.
A. spiniflorum (Schum.) Bckbg. 1935 (Etus. K. Schum. 1903, Eps. Berger 1929)
A. thionanthum (Speg.) Bckbg. 1935 (Lob. thionanthus (Speg.) Br. & R.)
A. violaceum (Werd.) Bckbg. 1935 (Eps. Werd. 1931)

These Rebutia have appeared on the Mediolobivia Working List:

Mediolobivia aureiflora Bckbg. (Rebutia aureiflora Bckbg.)
M. euanthema Bckbg. (R. oculata Werd.)
M. longiseta Bckbg. (R. aureiflora Var. longiseta Bckbg.)
M. haagei (Fric & Schelle) Bckbg. (R. haagei Fric & Schelle)
M. pygmaea Bckbg. (R. pygmaea (Fries) Br. & R.)
M. sarathroides (Werd.) Buining (R. sarathroides Werd.)
M. steinmannii (Solms-Laub.) Bckbg. (R. steinmannii (Solms-Laub.) Br. & R.)

Supplement and Bibleograph in October Issue

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

OCTOBER, 1957

Echinomastus acunensis
Marshall

One of the many species of cactuses found or described by Mr. Marshall

Wm. Supernaugh photo

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

Volume 11 OCTOBER, 1957 No. 8

Arizona Cactus and Native Flora Society

EXECUTIVE BOARD

Chairman of Board — John H. Eversole Treasurer — Tom Goodnight
President — Lou Ella Archer Secretary — Angela Bool
Chief Counsel — William Eliot

BOARD MEMBERS

Edward L. Burrall Charles Mieg Mel Hinman
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Desert Botanical Garden of Arizona

STAFF

Consulting Botanist.....James A. McCleary, Ph. D.
Superintendent.....W. Hubert Earle
Assistant Horticulturist.....Donald Griffith
Research Associates.....Charles Mieg, Gus Hermann, Sylvia Hermann, Isabelle Holt, Jane Cowper

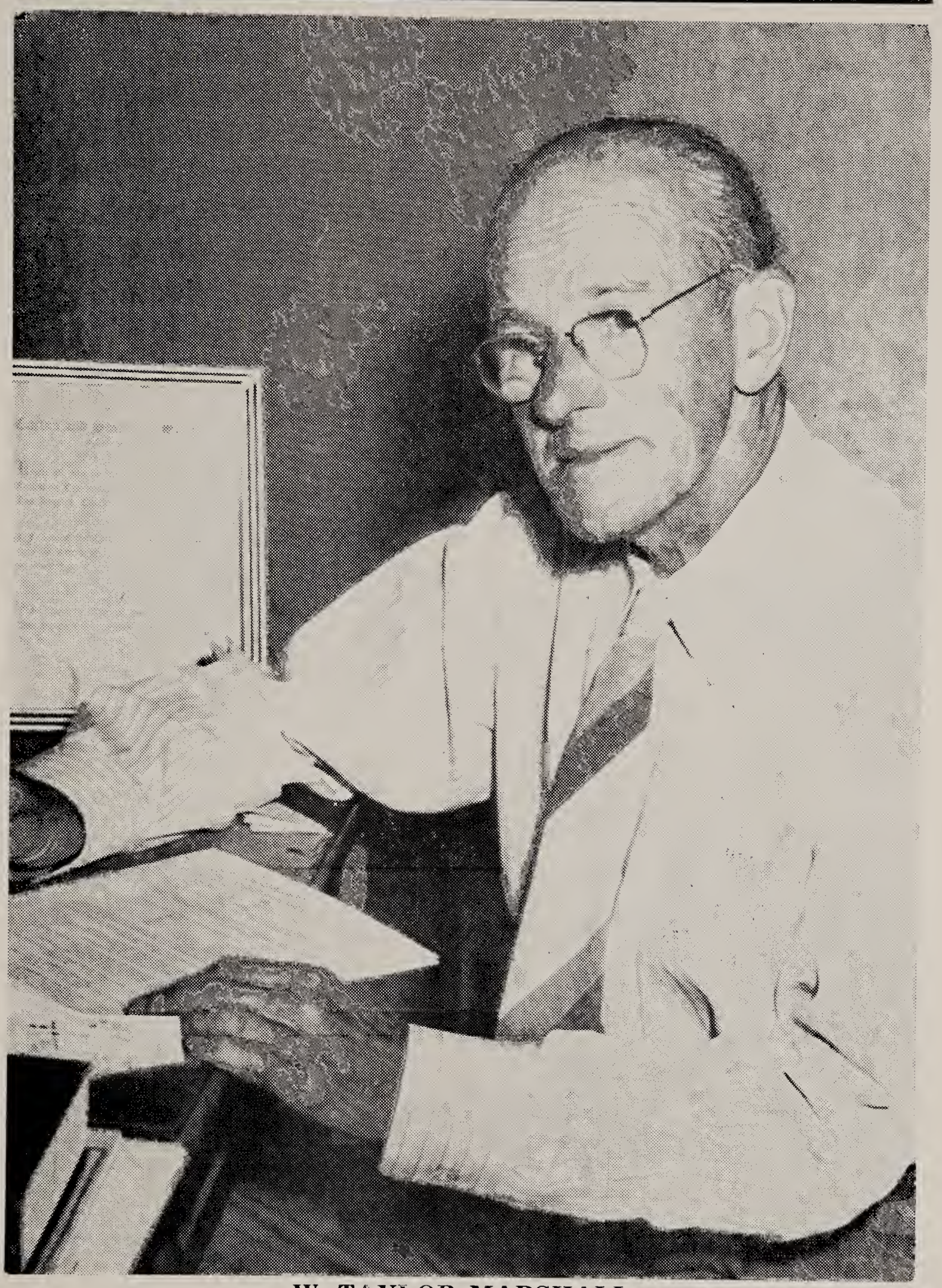
Garden open after September 14th on Saturdays and Sundays, 1:00 P.M. to 5:30 P.M.
After September 28th, Garden open daily 9:00 A.M. to 5:00 P.M.

EDITORIAL

It is with regret that we publish this issue of the Saguaroland Bulletin announcing the passing away of our Director W. Taylor Marshall. Yet it gives us the opportunity to show to you some of the many activities and improvements made during his 10½ years as Director.

The fact should not escape us that when he took over the directorship in December, 1946 there was hardly enough money in the treasury to pay his first month's salary, yet he envisioned a wonderful future for the Garden and worked unselfishly towards that end.

His achievement in the Garden is graphically shown on page 95 of this issue. What more can one man do?



W. TAYLOR MARSHALL

May 5, 1886 - August 25, 1957

IN MEMORIAM

W. Taylor "Bill" Marshall was director of the Desert Botanical Garden of Arizona for just a little more than ten years, but the things he accomplished in that single decade would do credit to a lifetime of effort. It is no exaggeration to say that without him there would be no Desert Botanical Garden here today.

Bill would have protested at this point that many other people have contributed lavishly of their time and treasure in behalf of the Garden, and that is true. But that very fact is also a tribute to Bill Marshall's selfless devotion, which inspired the generosity and loyalty of those who knew him. To learn in detail the contributions of others to the Botanical Garden, we have only to read back issues of the "Saguaroland Bulletin" wherein Editor Marshall scrupulously noted every kind and generous act . . . But nobody gave more than Mr. Marshall himself. He gave invaluable collections of plants; he made great financial sacrifices; he gave every waking hour of his time. Almost literally he was carrying on business of the Garden with his last breath. But he would never have let it be said that he gave his life. Rather he would have said that the healthful desert climate of Arizona added years to his life. This is quite probably true. Certainly his work here enriched and gave full purpose to his final years.

We of the Executive Board of the Arizona Cactus and Native Flora Society, operating the Desert Botanical Garden of Arizona, feel deeply privileged to have worked with W. Taylor Marshall, the most devoted and dedicated man we have ever known. His memory shall live as long as any of us live. It shall be our goal to try to carry on the great work he started here. With the help of the membership of the Society, each of whom Bill regarded as a personal friend, we shall attempt to continue the work of the garden as a living memorial, a particularly fitting memorial to a truly great human being.

THE EXECUTIVE BOARD
Arizona Cactus & Native Flora Society, Inc.

The Garden as Mr. Marshall left it.

THERESE MARSHALL

We believe it is fitting at this time, while remembering the great work of W. Taylor Marshall, to make special mention of the work of his wife, Therese. Mrs. Marshall contributed vastly to the success of the Desert Botanical Garden in all the countless ways every good wife lends unsung aid to her husband. But Therese Marshall also presided over that all-important Garden adjunct, "the table." "The table" was originally just that, a table in a corner of the Administration Building, with a few books and curios for sale. It has long since outgrown four legs, and its merchandise laden counters are an important financial bulwark of the Garden. The hours, weeks, years, Mrs. Marshall spent behind "the table" without thought of compensation, can never be calculated. But the staff and Board of the Garden want her to know that those hours of service did not go unnoticed. For all the membership, Therese Marshall, we say a heartfelt THANKS.

THERESE MARSHALL
Mouton Smith photo

The following pictures illustrate only a few of the many accomplishments of Mr. Marshall while Director of the Garden

INSTRUCTION

A Biology class of the Scottsdale High School with their teacher, Mr. Cecil McGreer, extreme left, presenting a membership check to Mr. Marshall, April, 1955

CACTUS SHOWS

Judges and clerks working the 8th Annual Cactus Show. Left to right: W. Taylor Marshall, Herbert Bool, John Hales, Wm. Rand. John Eversole photo

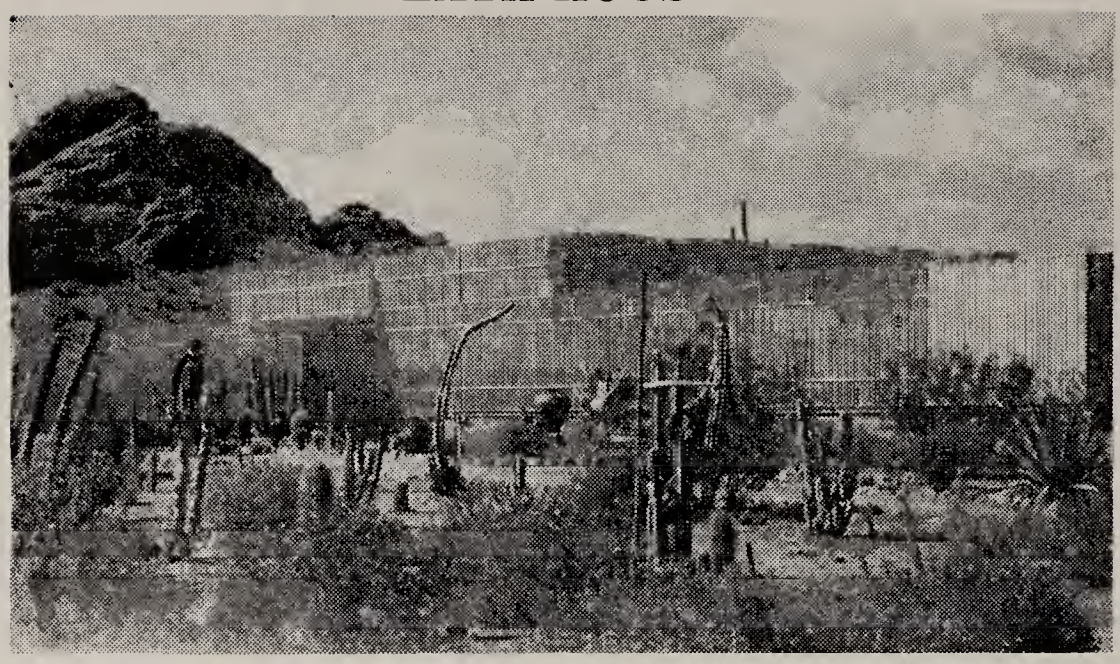
EXPEDITIONS

Expedition members inspecting plants they collected in the Monument Valley area. Left to right—Mr. Marshall, Wayne Thompson, Ken Fisher, the late Emil Bien, Mrs. Marie Bien, T. Boyles and Robert Leigh.

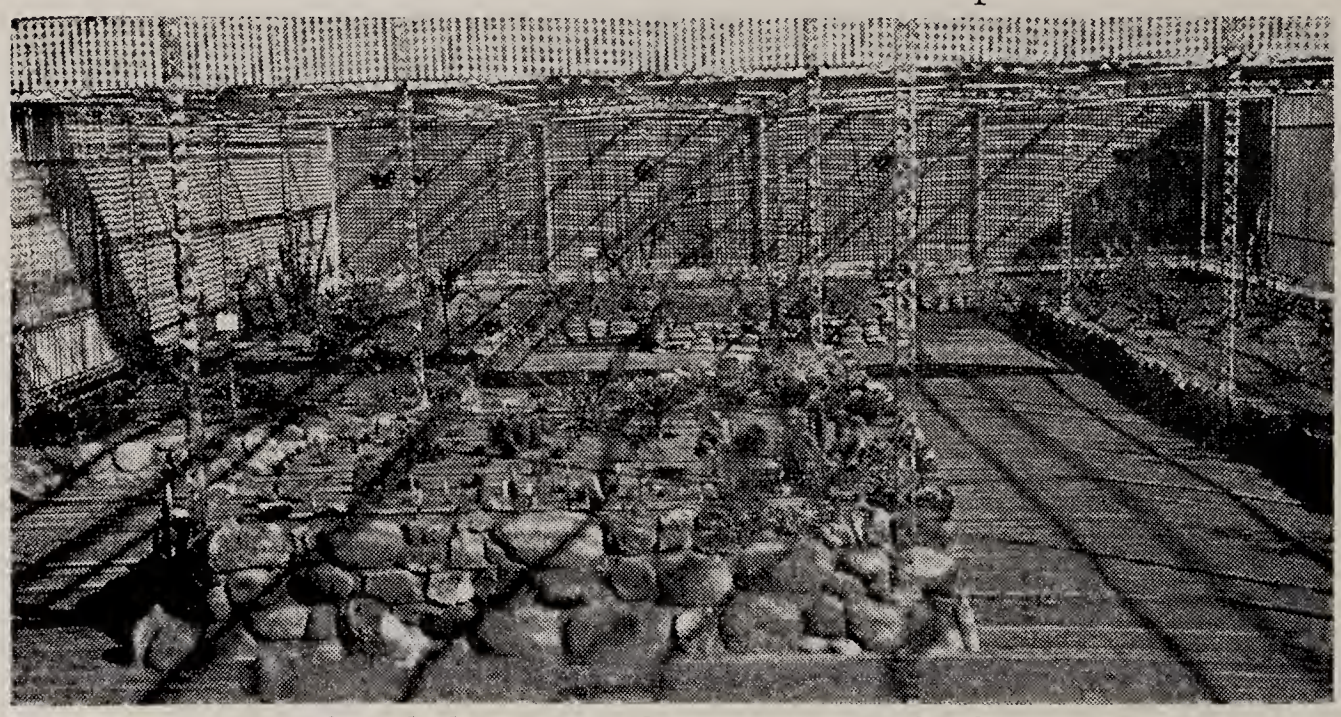
PUBLICATIONS

A few of the books Mr. Marshall wrote and periodicals to which he contributed. Reg Manning photo.

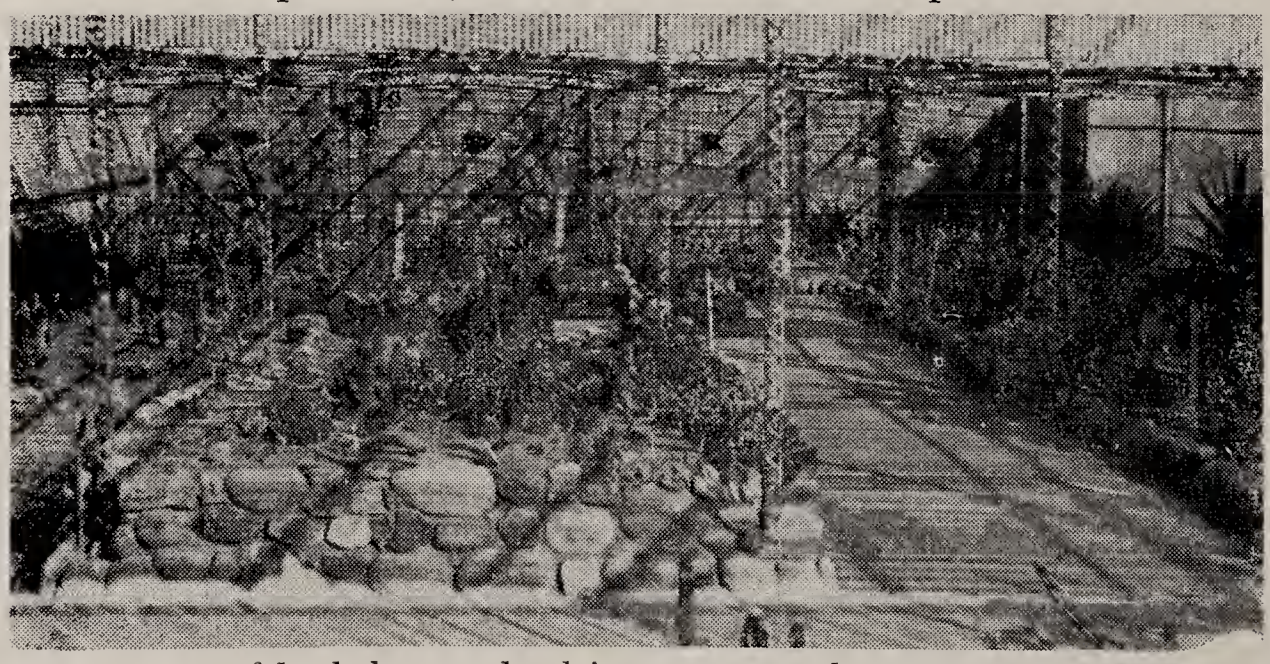
LATH HOUSE



5,000 sq. ft. aluminum lath house, built 1950, for tender cactus and leaf succulents. R. C. Proctor photo.



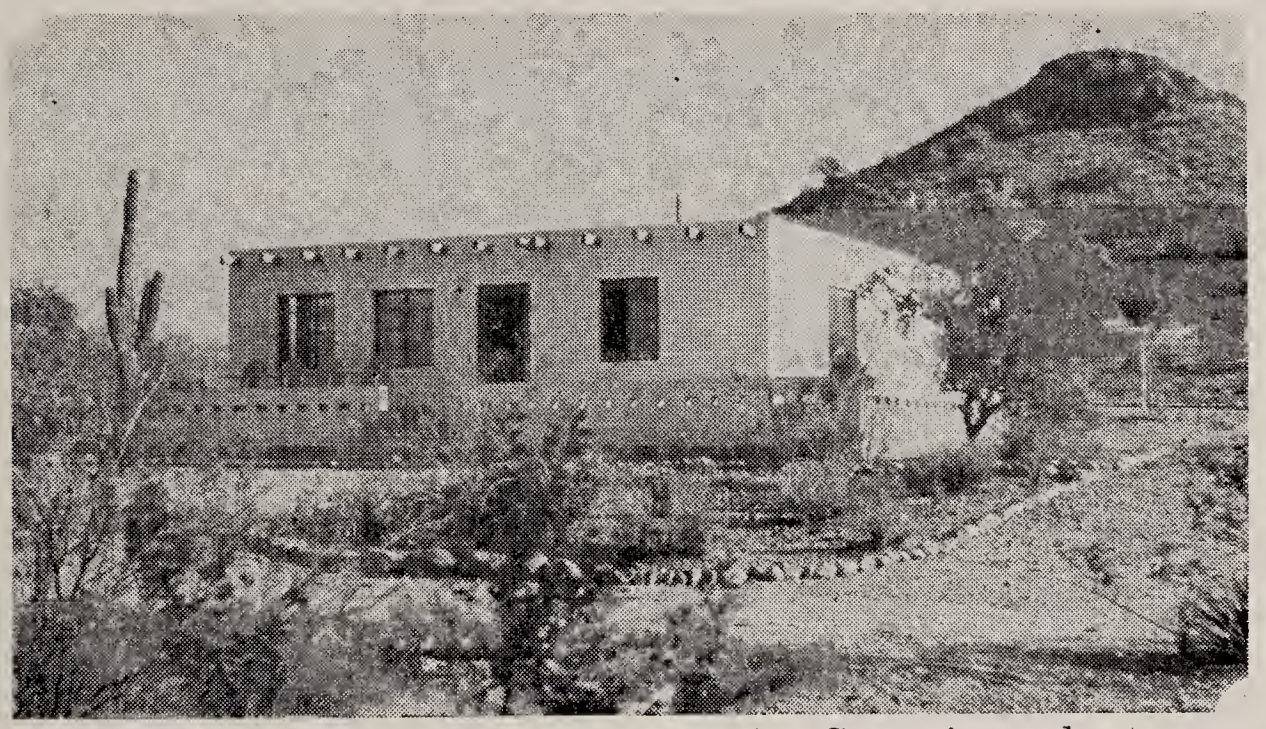
Interior view of lath house looking east with the new plantings September, 1950 - R. C. Proctor photo



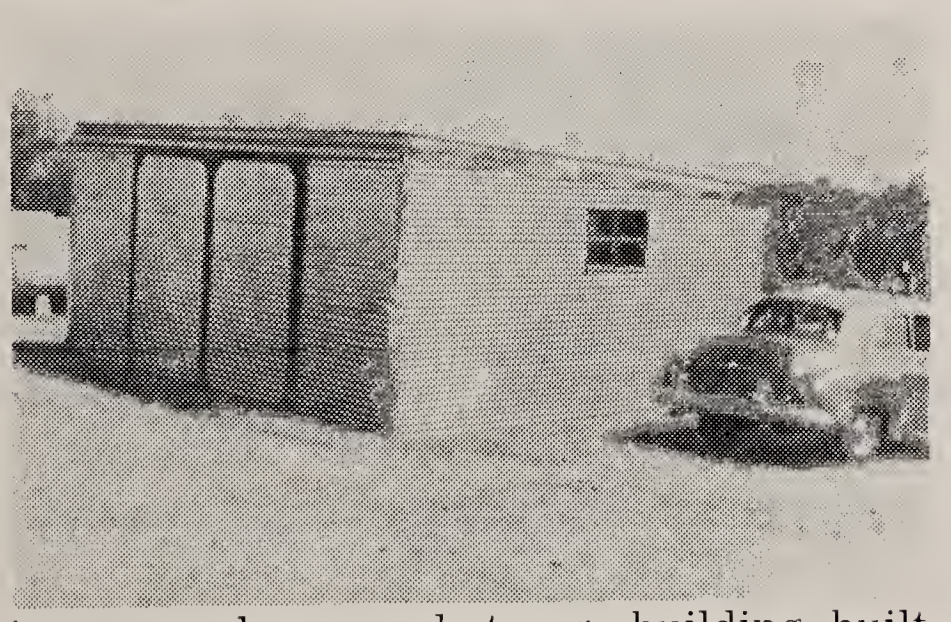
Interior view of lath house looking east at the present time showing the growth of the plants

BUILDING PROGRAM

Our modern rest rooms building, built 1950



Archer House erected in 1952 for Superintendent

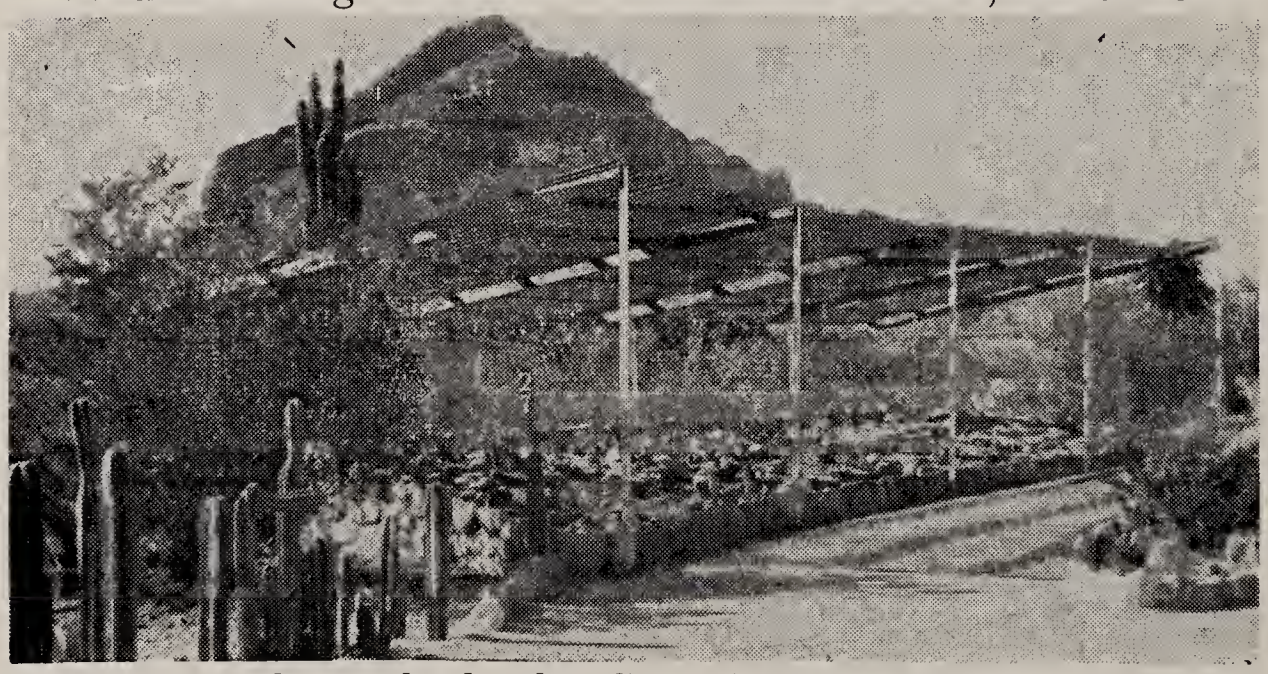


Aluminum warehouse and storage building, built 1956.

BEAUTIFICATION OF GROUNDS

One of five stone and cement benches located in the garden built in 1951

Outdoor living room with Mexican influence, built 1953



A ramada built to shade the Coryphanthas that do well with partial shade. Barnes Butte in background.

SUMMARY OF THE DEVELOPMENT OF THE GARDEN FROM 1947 - 1957

1947	1957
	BUILDINGS
Webster Auditorium Tool House (razed 1956) Car Port (razed 1952)	Webster Auditorium, Rest Rooms, Lath House, Glass House, Archer House, Carport, Warehouse, Garden partially fenced.
	STAFF
Caretaker	Director, Horticulturist, Gardener, 2 part-time students (winter), 1 volunteer sales clerk (Mrs. Marshall)
	MEMBERSHIPS
19 active	380 active
	PLANTS
683 accessions 300 additional plants	5,466 accessions 12,500 additional plants
	ATTENDANCE
Zero	55,000 approximately (10,000 Guided tours x 5.5)
	LIBRARY
Approximately 80 books	566 books 2,584 periodicals 304 separata
	HERBARIUM
None	4 herbarium cases with 2,430 mounted sheets, 1,460 unmounted sheets
	GARDEN PUBLICATIONS
None	Saguaroland Bulletin — 10 issues yearly since Jan. 1948. Arizona Cactuses — 8,600 copies Introduction to Desert Plants — 2,200 copies Self-Conducted Nature Walks — 30,000 copies
	LECTURES
None	One each Thursday, 3:30 P. M. 1-3 given during the week at hotels, clubs, etc.
	CLASSES
None	One each Tuesday at 7:30 P. M. One each Wednesday at 3:30 P. M.
	ENDOWMENTS
None	Gertrude Divine Webster Trust—($225,000)

HE LEFT HIS MARK

Although he had been a resident of the state only 11 years at the time of his death this week, the late W. Taylor Marshall brought international distinction to Arizona in the time he served as director of the Desert Botanical Garden in Papago Park. The most remarkable aspect of his botanical fame is the fact that he earned it in a field which he did not enter professionally until coming to Arizona from Pennsylvania.

Under Mr. Marshall's direction a small collection of desert plants was expanded until it became the largest of its type in the world. The author of a dozen volumes on cactus, his "Cactaceae" has been translated into French by the French Museum of Natural History. He was a former member of the Arizona State Parks Association Board, president emeritus of the Cactus & Succulent Society of America, a fellow of the American Association for the Advancement of Science, and a charter member of the International Association for Succulent Plant Study.

Recognized internationally as an authority on cactus, Mr. Marshall never permitted his writing and professional honors to interfere with his devotion to the Papago Park garden which became one of the Valley's major attractions under his direction. Many men and women find new lives and new interests in Arizona. But rarely does one carve out a new career of distinction in the later years of life.

Editorial in the Phoenix Gazette
Aug. 28, 1957

SUPPLEMENT AND BIBLIOGRAPHY TO COMPLETE 'THE GENUS REBUTIA' — ISABELLE HOLT

Of the August-September Issue

SUPPLEMENT

Add to the Lobivia Working List in the preceding issue: Lob. janseniana Bckbg. and Var. leucacantha Bckbg.

Add to the Mediolobivia Working List: Med. rubriflora Bckbg. Var. blossfeldii (Werd.) Krainz, Var. compactiflora (Wessn.) Krainz, and Var. nigrilongiseta (Werd.) Krainz.

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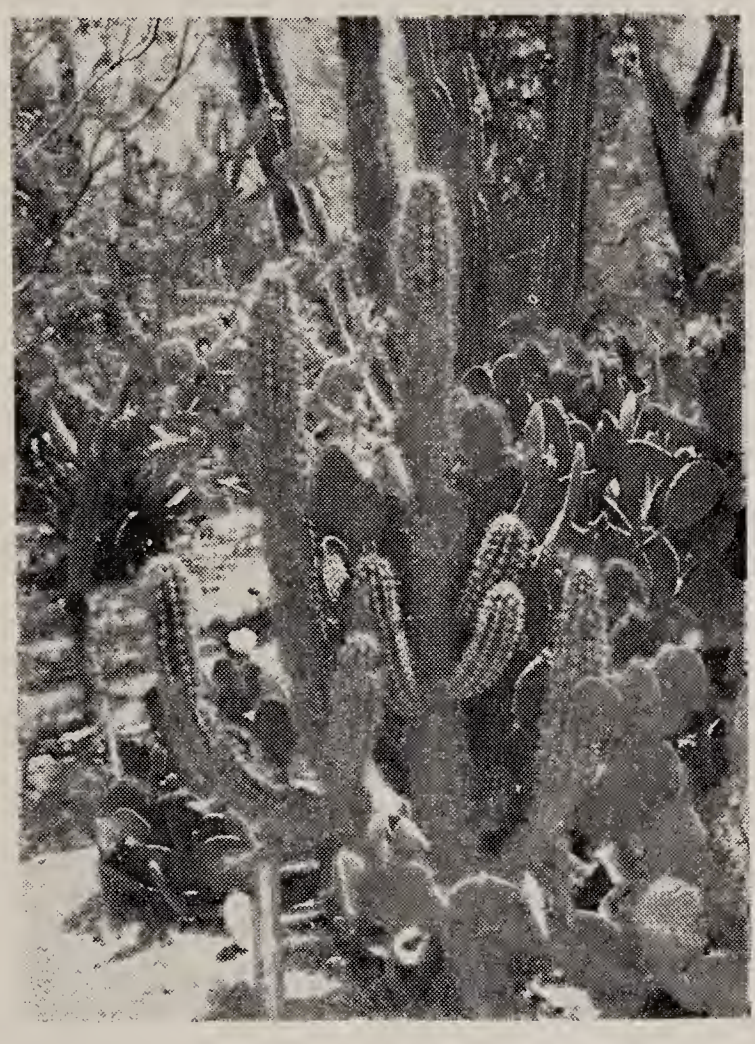
NATIONAL CACTUS and SUCCULENT JOURNAL, Vol. 12, No. 1, March, 1957, Nottingham, England.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

NOVEMBER, 1957



Lophocereus gatesii Marshall
Baja California, Mexico

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W. HUBERT EARLE, Editor

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GARDEN OPEN DAILY 9 A. M. TO 6 P. M. INCLUDING HOLIDAYS

EDITORIAL

It is always gratifying to get the Garden, after a hot dry summer, into a presentable condition so that it can be reopened in the fall and we again welcome members, familiar visitors and out-of-state visitors.

The attendance since the October 1st opening is slightly greater than last year due to the increase in local population and many more travellers on the highways.

As you will notice at the foot of the opposite page, the Garden is now open daily from 9 A. M. to 5 P. M. We have had so many requests from persons who can come out to the Garden only on Mondays that we have decided to stay open that day. Opening an hour earlier and open daily has already shown an increase in new memberships and a decided increase in sales at our Book Store.

Classes in "A Better Understanding and the Growing of Desert Plants" will begin Wednesday, Nov. 6th at 3 P. M. and continue each Wednesday for six weeks. The classes will be held in the Webster Auditorium and will be repeated Jan. 8th and again in March.

Lectures will begin Thursday, Nov. 7th and continue weekly until about the middle of April. The lectures for November are as follows:

Nov. 7th—Arizona Cactuses

Nov. 14th—Arizona Wildflowers

Nov. 21st—Arizona Trees & Shrubs

Nov. 28—Arizona Reptiles and Birds

The lectures will be of about 45 minutes duration with the use of Kodachrome slides and a running commentary beginning at 3 P. M.

The Saguaroland Bulletin is most anxious to publish articles pertaining to desert plants and we would appreciate writings from interested persons either in a popular or a scientific vein.

We wish to publish in each issue articles of botanical findings, culture of plants, places of interest in Arizona and articles pertaining to a better understanding of our desert plants.

If you have articles in any of the above categories, we would like to consider them for publication in this Bulletin.

Several months ago an appeal was made to members having Active (three dollar) memberships asking them to consider increasing their membership at renewal time to the Builder (five dollar) membership due to the increased costs of publishing the Bulletin. We wish to report that about fifty percent of the Active members have increased their renewals to the Builder class. This increase is certainly appreciated and we extend our thanks to you.

We would like to have you visit the Garden soon and make the acquaintance of our two new staff members; Don Griffith who started with us July 1st and Dave Nevin on October 1st. These two new staff members are doing a good job and fitting into our program. Sketches and photos of them will appear later.

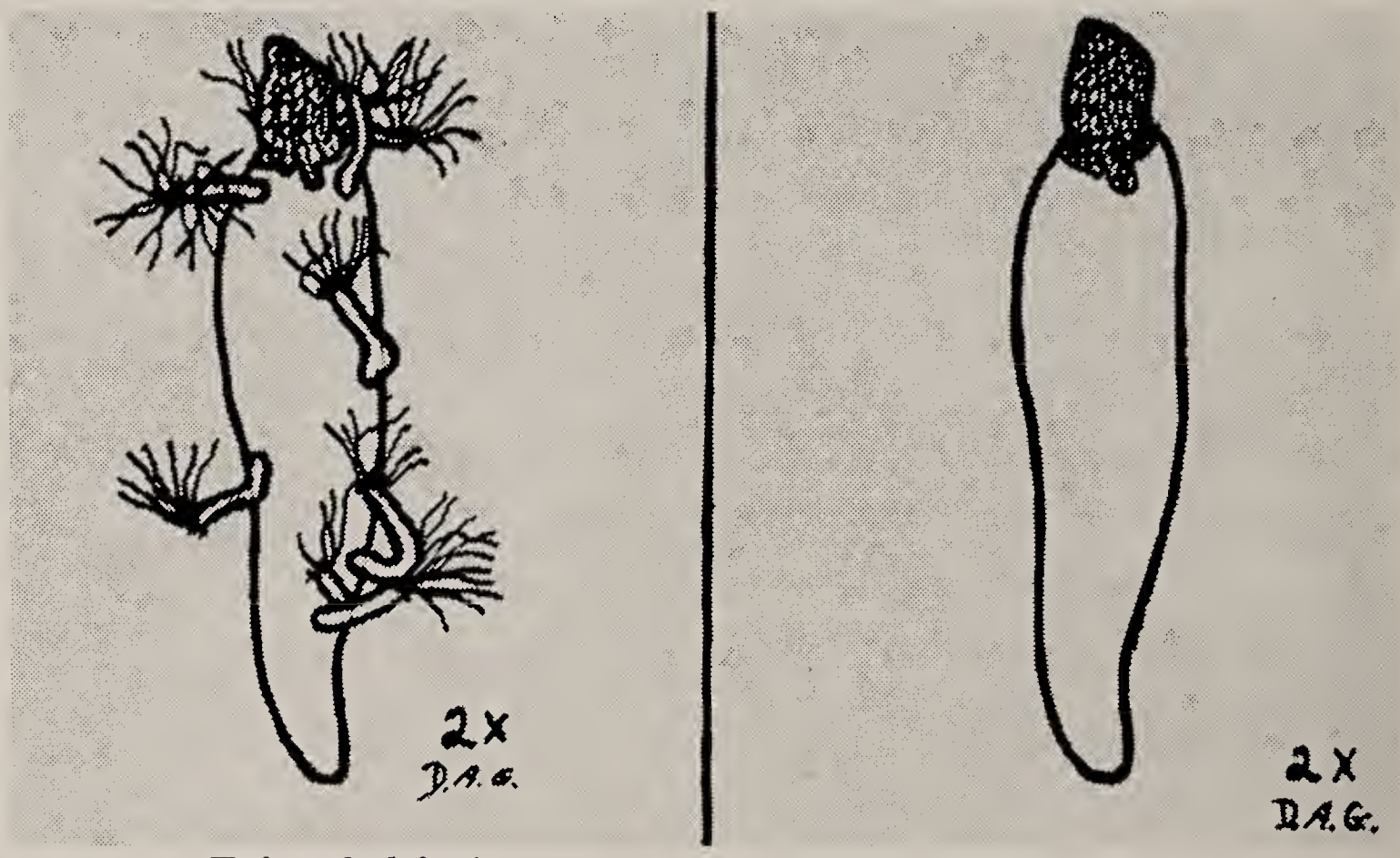
After 10 years of being on the receiving end of a ten-party telephone line, the telephone company finally came thru and gave us a private line last summer. The new number is BR 5-5592 and will be published in the January telephone directory.

STRANGE MAMMILLARIA FRUIT

At the last Cactomaniac meeting held at the Desert Botanical Garden, Mr. Gus Hermann, Phoenix, Ariz., showed two fruits that he had discovered on his Mammillaria microcarpa var. auricarpa having spine bearing appendages or tubercles adhering to the fruits as shown, twice normal size, on the accompanying drawing.

These short tubercles were ascending when the fruit was first removed from the plant but later became flacid. They appear to be attached to the cortical tissue but if studied further may prove otherwise.

We would like to pass on to any botanist doing Morphological work on Cacti one of these fruits for a complete study of this oddity. More fruits will be available about September 1958 for further study thru the generosity of Mr. Hermann. This is the first time such an oddity has been called to our attention at the Garden.



Tubercled fruit Normal fruit
Mammillaria microcarpa var auricarpa

WINTERING YOUR CACTUS

Now is the time to begin decreasing the amount of water that you have been giving your cactus plants. As the cool nights are now upon us, the cactus plants begin to go into a dormant stage or a period of rest. During this rest period they begin to set flower buds for the following spring.

If you continue to water your cactus thru the cool and cold weather, there is a possibility that rot from too much moisture might appear in your plants. If your plants get water during the winter and are inside of a building, they will continue to grow thru the winter but are not too interested in b'ooming the following spring as they have had no rest.

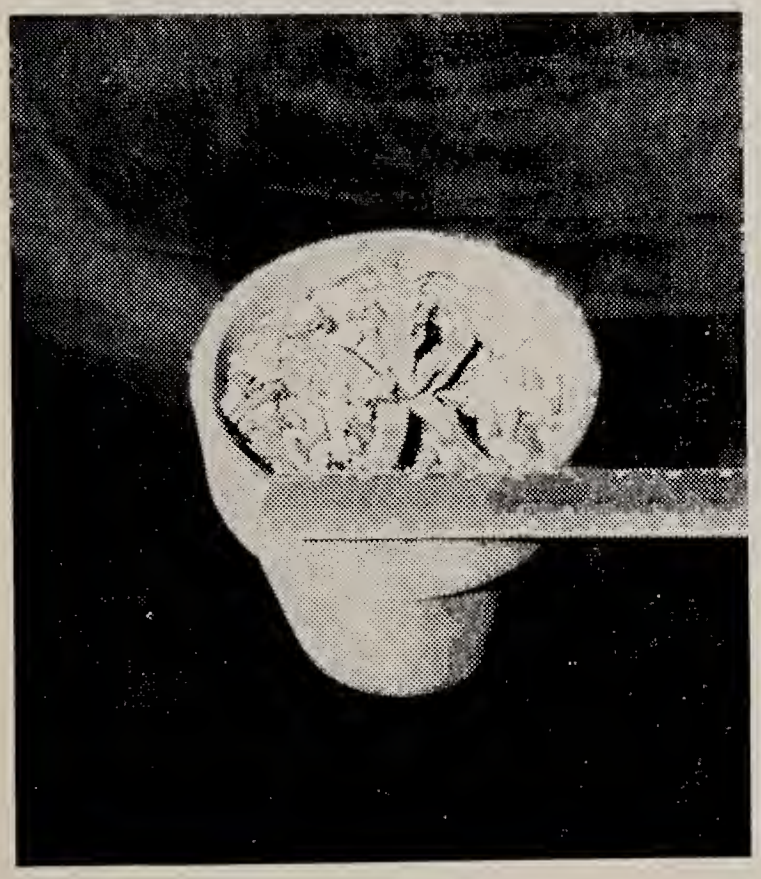
Many persons place their cactus plants in basements or root cellars in the fall and do nothing to them until spring. Then the plants are brought out to the light and watered and soon beautiful blooms appear because the plants have had a good rest.

Cactus plants that are kept in warm rooms and apartments can be lightly washed-off once a month but the ground in the pots should not be soaked until springtime. More cactus plants are killed with kindness than carelessness.

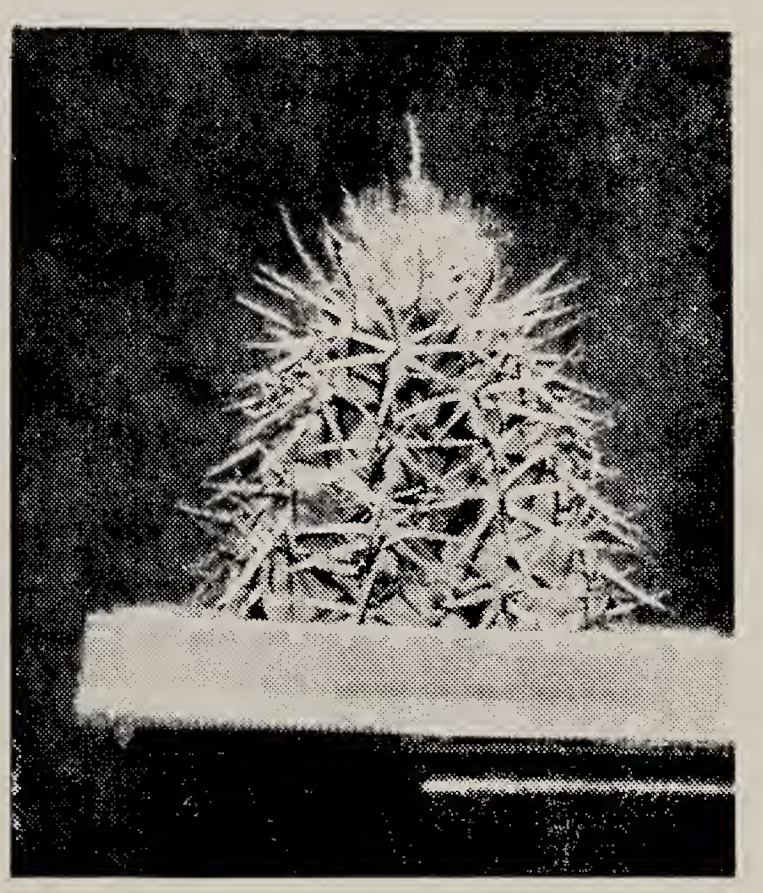
ACCESSIONS

The Garden has been very fortunate in the past few months to receive many fine plants from the following sources: J. B. Blakley, Santa Barbara, Calif., Yuccas, Dudleyas, Opuntias. John Weber, Phoenix, Mammillarias. Dudley B. Gold, Mexico City, Echinocereus, Mams. and Agaves. Gates Cactus Inc., Corona Calif., Ferocactus and Mammillarias. Wm. Rand, Phoenix, Haworthias. Gus Hermann, Phoenix, Sclerocactus. University of California Botanical Garden, Berkeley, Calif., Eulychnias, Cleistocactus, Espostoas, Trichocereus and Haageocereus. Manuel Diaz, Chandler, Ariz., Echinomastus and Neolloydias collected in Mexico.

Dr. Jose de Ji Jimenez, Repub ic Dominican, Melocactus and Consoleas. Denis Cowper, Belen, N. M., Encephalocarpus, Obregonia, Neolloydias, Neogomesia, Strombocactus, Ariocarpus, Ferocactus, Astrophytum, Mammillarias, Coryphanthas, Echinocactus, Echinocereus, Thelocactus, Opuntias, Acanthocereus and Melocactus. Johnson Cactus Gardens, Paramount, Calif., Parodias, Neoporterias, Coryphanthas, Echinopsis hybrids, Hoya and Senecios. Boyce-Thompson Arboretum, Superior, Ariz., shrubs of Australian and Arizonian deserts.



Neogomesia agavioides
Collected by Mr. & Mrs. Dennis
Cowper, Belen, N. M.
in Taumalipas, Mexico.



Melocactus lemarei, Collected by
Dr. Jose de J Jimenez
Santiago de Los Cabaleras
Republic Dominican

The skeleton structure of Arizona's Organ Pipe Cactus.
Pack rat's nest at base of Organ Pipe Cactus
Saguaros (Giant Cactuses) in background
Photographed in Organ Pipe Cactus National Monument
by R. C. Proctor.

GENUS II OPUNTIA

These plants, which are beautiful, yet rather mean to handle, have one distinct factor that puts them into this class by themselves. They have glochids (barbed hairs) in the areoles and these areoles usually are spine-bearing besides. The young branches have leaves which disappear in a short time, except in Opuntia subulata which has awl-shaped leaves and is not a native of Arizona.

All plants in this Genus, regardless of the sub-genera or their many relatives also have certain other characteristics in common. To start at the bottom so to speak, let's first look at their feet. Their roots are fiber-like or tuber-like. The body or stems are sometimes woody, sometimes round, sometimes flat, and, as mentioned above, the spine cushions (areoles) bear bristles or barbed hairs (glochids), hairs, spines, flowers and sometimes awl-shaped leaves. The flowers are wheel-shaped. They have a variety of color shades and combinations of green, yellow, red and (rarely) white. The fruit we will discuss with the plants as they vary in appearance and consistency. Opuntias can be found in a wide range of territory from British Columbia in Canada to the southernmost tip of South America. One species noted is in the Arctic regions; but we will study here only the local Arizona plants.

As has been noted, Genus Opuntia has been divided into sub-genera and each of these has its own particular characteristics.

Sub-genus — Cylindropuntia — so named because the stems of this plant are cylindrical in shape. These stems may be nippled, sometimes the nipples are so blended into each other that they might be missed at first glance.

In Arizona we find these species: O. ramosissima, O. leptocaulis, O. kleiniae, O. arbuscula, O. spinosior, O. whipplei, O. versicolor, O. fulgida, O. bigelovii, O. echinocarpa, O. acanthocarpa, and their varieties.

O. ramosissima is easily distinguished from the other Arizona chollas (Mexican name for small stemmed cactuses) by its woody stems and the diamond-shaped shields which cause the stems to appear as though protected by chain-armor. It is a shrubby, much-branched plant. Spines sometimes absent entirely but usually one or two, 1½ to 2 inches long, always covered with a papery sheath which is pale yellow or pale tan; flowers are small, yellowish-green; fruit almost cylindrical, dry and very spiny.

O. leptocaulis (the desert Christmas cactus) is another woody, stemmed, small, bush cholla. Spines are white, 1 to 2 inches long, covered with a light tan papery sheath; flowers ½ to ¾ inch in diameter, green to yellow; fruits red when ripe, inverse egg-shaped, and remain on the plants until late December — thus the name Christmas Cactus.

The plants O. kleiniae and O. arbuscula both have terminal stems ⅜ to ½ inch in diameter. The stems of O. kleiniae are noticeably nipp'ed and the flowers are purplish; fruit red, fleshy. The stems of O. arbuscular are usually smooth; flowers produced along the stems, yellow, green or terra-cotta; fruit pear-shaped, spineless, green and somewhat juicy.

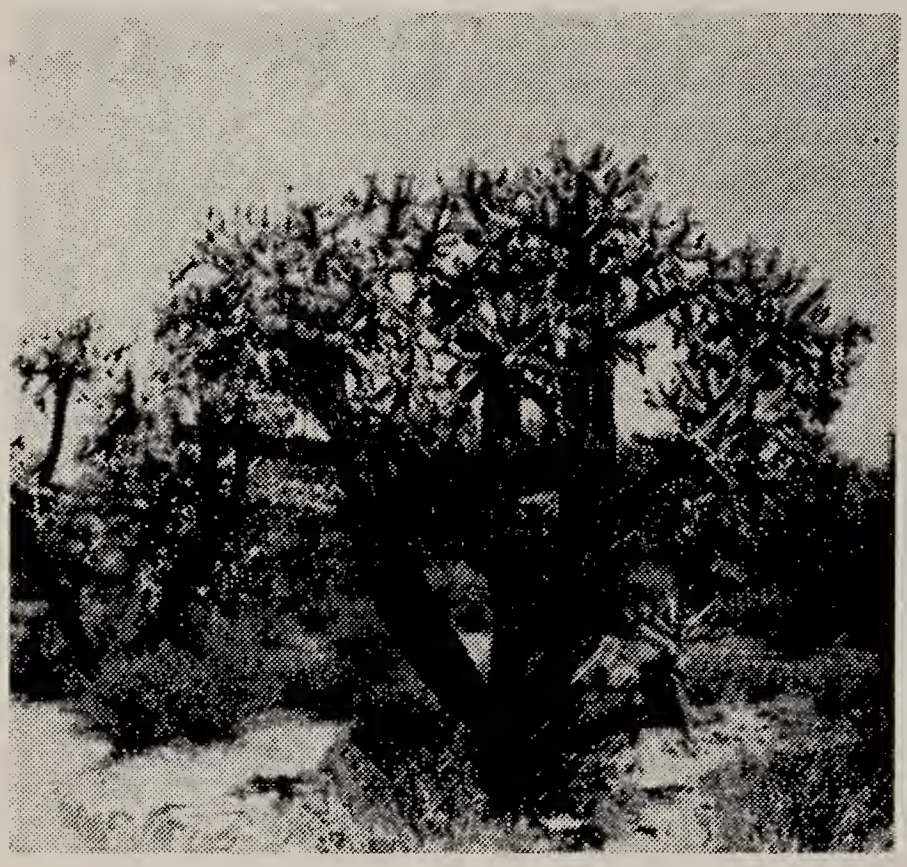
O. versicolor, as its name suggests, is a colorful plant with green, purplish-green or brownish-red stems, strongly nippled; circular areoles, bearing white wool, short barbed bristles, and five to eleven gray or purplish spines; flowers are wheel-shaped, variously colored with a range from green, yellow, orange, bronze to red; fruit is green, tinged with purple or red, pear-shaped, fleshy and spineless.

Another of the purplish tinted opuntias is O. spinosior; a tree-like cholla 3 to 12 feet tall; stems are green but occasionally have a purple coloration; the plant is spiney, about 10 to 20 to an areole, gray or tinged with red or purple; flowers with ten petals, white to yellow; fruit lemon-yellow, fleshy, strongly nippled, reverse egg-shaped, persisting through the following winter.

O. whipplei is usually fairly low growing; stems much nippled; spines vary in length and have straw colored sheaths; flowers small, pale yellow to greenish yellow; fruit yellow, fleshy, globe-shaped, strongly nippled, not spiney and remaining through the winter.

iety found in collections is liked because of its tendency to crest and is commonly known as the boxing glove (O. fulgida variety mammillata.)

The plant most beautiful when the setting sun shines through its straw-colored spines (but also the one most disliked because its barbed spines, if even lightly contacted, will become firmly affixed to clothing, person or cattle, and pull off the entire branch) needless to say is one of the species commonly known as "Jumping Cactus", sometimes also called "Teddy Bear Cholla." Flowers are pale green, yellow or white; fruit is green, falling to the ground where it roots to form new plants. This plant's botanical name is O. bigelovii.



Sub-genus — Cylindropuntia
Opuntia fulgida
'Chain fruit cholla'
Florence, Ariz.

O. fulgida, commonly known as the chain-fruit cholla because the green colored fruit persists for many years, and frequently flowers and fruits on the fruit of the previous year, until chains are formed; since the plant is tree-like in growth this fruit gives it a weeping appearance. The end stems are much nippled, very juicy, and easily broken from the main stalk; spines yellow to brown; flowers pink or white with streaks of lavender. Another var-

The "Silver", or "Golden" cholla, depending on spine color, O. echinocarpa, has stems conspicuously nippled; flowers with few petals, greenish yellow with a reddish streak on the outer ones; fruit dry and densely spiney.

O. acanthocarpa is a shrub-type cholla but sometimes grows very low and sprawling; stems are covered with closely set spines, straw-colored; flowers are usually red or yellow; fruits dry and very spiney. This plant is com-

Sub-genus Corynopuntia
Opuntia stanlyi 'Club cholla'
Safford, Ariz.

monly called "Buckhorn" cholla.

Sub-genus — Corynopuntia is a group of plants that creep along the ground forming mats of club-shaped joints with unsheathed spines. Arizona has two in this sub-genus O. stanlyi, which has stems 2½ inches long or longer and a well developed woody framework; flowers are pale yellow and fruit spiney, yellow, persistent, and O. parishii which has stems 2 to 3 inches long, nippled, covered with heavy spines, the central ones strongly flattened, white; flowers pale lemon-yellow; fruit spiney, carmen red.

Sub-genus—Platyopuntia. It is easy to see why this group has this name for they are all plate-shaped, flat, some very spiney, others with no spines and some barely having noticeable glochids.

Arizona has a number of plants in this sub-genus, namely: O. basilaris, O. polyacanta, O. erinacea, O. fragilis, O. compressa, O. phaeacantha, O. engelmannii, O. flavescens, O. laevis, O. chlorotica, O. macrocentra, and O. santa-rita.

O. basilaris is spineless but has plenty of glochids; low growing, usually one-jointed, but has had up to 5 joints which are obovate, 2 to 5 inches wide, 5 to 6 inches long; flowers large and showy, purple to magenta or light pink; fruit dry, spineless, not edible. Commonly known as the "Beavertail" cactus this plant tends to become wrinkled in winter or dry periods.

O. polyacantha is a low grower too, with circular pads 2 to 4 inches in diameter, bearing 7 to 10 spines, circular in cross section, those on the margin of the joint 1 to 2 inches long, the others ½ to ¾ inches long; flowers yellow or pale yellow or tinged with pink; fruit reverse egg-shaped, dry, spiney.

A very close relative to the above is O. erinacea, in fact separation is extremely difficult. Joints are plate-shaped, egg-shaped, or elliptic; spines (4 to 9) up to 4 inches long, more or less stiff, somewhat flattened at the base; flowers yellow, white, pink, or red; fruit dry, cylindrical, spiney.

The plant O. fragilis is found over a wide range of the Southwest because it, like O. bigelovii, will attach itself very easily to any passing object. It is different from the rest of the platyopuntias we have so far been studying as the joints are obovate or rarely cylindrical, 1 to 2 inches long and about 1 inch wide; spines long slender and

Opuntia erinacea Engel. & Bigel.

tapering, brown; areoles also contain brown wool and yellowish glochids; flowers pale yellow; fruit dry, spiney.

O. compressa is another of the low growing prickly pears, one of its distinguishing features being in its root structure. They are fibrous, but one variety (O. compressa variety marcrorhiza) has tuberous roots. Another distinguishing feature is that it, like O. basilaris, has a tendency to shrivel or wrinkle during winter or dry periods; joints are obovate to nearly circular, 2 to 4½ inches long and 2 to 4 inches wide; spines none, or one in upper areoles; flowers pale yellow, sometimes with a reddish center; fruit more or less juicy.

The pads of O. phaeacantha are 4 to 9 inches long and 3 to 6 inches wide; they form chains along the ground and root at the point of contact, with other pads erect from them; spines 1 to 3 inches long, brown, reddish, or occasionally yellow, tapering and somewhat flattened; flowers yellow or (rarely) magenta; fruit fleshy, narrow egg-shaped or nearly cylindrical, wine-red, not spiney, but bearing clusters of glochids. The fruit of this prickly pear is used to make tasty jelly and candy, however, it is to be noted that the perfecting of the tastiest foods always takes time and study and therefore we do not advise the average person to gather fruit for experimenting. (The Desert Botanical Garden of Arizona has delicious prickly pear jelly and candy in its book store for those who care to see how these products taste.)

O. engelmannii is a large prickly pear growing up to 6 feet high and 15 feet in diameter; joints are egg-shaped to plate-shaped, 7 to 11 inches long and 6 to 8 inches wide; spines spreading variously but most of them turning downward, stout rigid, 1 to 2 inches long, the larger one flattened; flowers first greenish yellow then deepening to apricot; fruit red or purple, juicy, edible, spiney at first then bearing only glochids at maturity. This is the largest species of prickly pear to be found in Arizona.

The spines of the O. flavescens vary in size from the small accessory spines 1 to 2 inches long and appear only on the upper margin of each joint; joints up to 10 inches long and 7 inches wide; flowers yellow; fruit reverse egg-shaped, red, juicy, the pulp yellowish, edible. This plant's name comes from the color of the pulp of the fruit which is highly esteemed for its flavor by the Papago Indians.

O. laevis forms chains of as many as 7 joints which are narrowly egg-shaped, up to 9 inches long and 4 to 5 inches wide; spines are few, pale

gray, ½ inch long, appearing in the upper areoles; flowers light yellow; fruit nearly cylindrical, reddish or purple, fleshy, not spiney. This species is a favorite food of cattle because of its lack of spines.

Old "Clock Face", or the "Pancake" prickly pear, O. chlorotica, is an erect plant with joints circular or plate-shaped, 6 to 8 inches long and 5 to 7 inches wide; the spines are light yellow (the glochids are deeper yellow) about 1 inch long and all turn downward; flowers light yellow; fruit grayish tinged with purple, fleshy, sphaerical.

The next two plants have a common factor in that they have a tendency to turn purple in winter or in dry periods.

O. macrocentra has 4 inch long, easily bent, dark brown becoming grayish spines. It has been noted that several plants all in the same location will vary in pad coloration from blue-green to deep purple. The joints of this plant are reverse egg-shaped, 4 to 7 inches long and 3 to 6 inches wide. The above mentioned spines arise from center; fruit egg-shaped, fleshy, red, not spiney.

O. santa-rita is a handsome plant when its normally azure blue or green pads become red-purple; young joints are deep maroon, bearing bright green awl-shaped leaves; spines are usually absent but when present vary from 1 to 3 to an areole, the longer ones up to 4 inches long, slender, red at the base; flower light yellow; fruit slender, purple, fleshy and curved.

As I write this it is with regret that I cannot thank in person, the one who was the most help to me, as a new lover of cacti, to be able to understand what little I do know of these fascinating plants. He has gone to a land of eternal light. I must, however, state that the above information was used with his permission and is only to be used to arouse your interest in learning more about the genus Opuntia as this is in no way a complete amount of information on any of the above mentioned plants and their families. Thanks to Mr. W. Taylor Marshall for the privilege of the use of information in his book, "Arizona Cactuses".

This summary of Arizona Opuntias was given by Mrs. Harold Covert at the Cactomaniac's October meeting.

Sub-genus Platyopuntia
'Purple Prickly Pear'
Santa Rita Mts., Ariz.

It is with sorrow that we report to our members the death of Howard Gates of Gates Cactus Inc., Corona, Calif. Howard passed away Oct. 4th with a heart attack. To most of the cactus fanciers he was known as 'Mr. Cactus'. His many generous gifts of plants to the Garden helped the Garden to expand and to fill our large lath house. He made many trips into Mexico collecting plants and his collection of Baja California plants was the best in the country. Among his many discoveries was Lophocereus gatesii, as shown on the front cover, and described by his explorer companion the late W. Taylor Marshall.

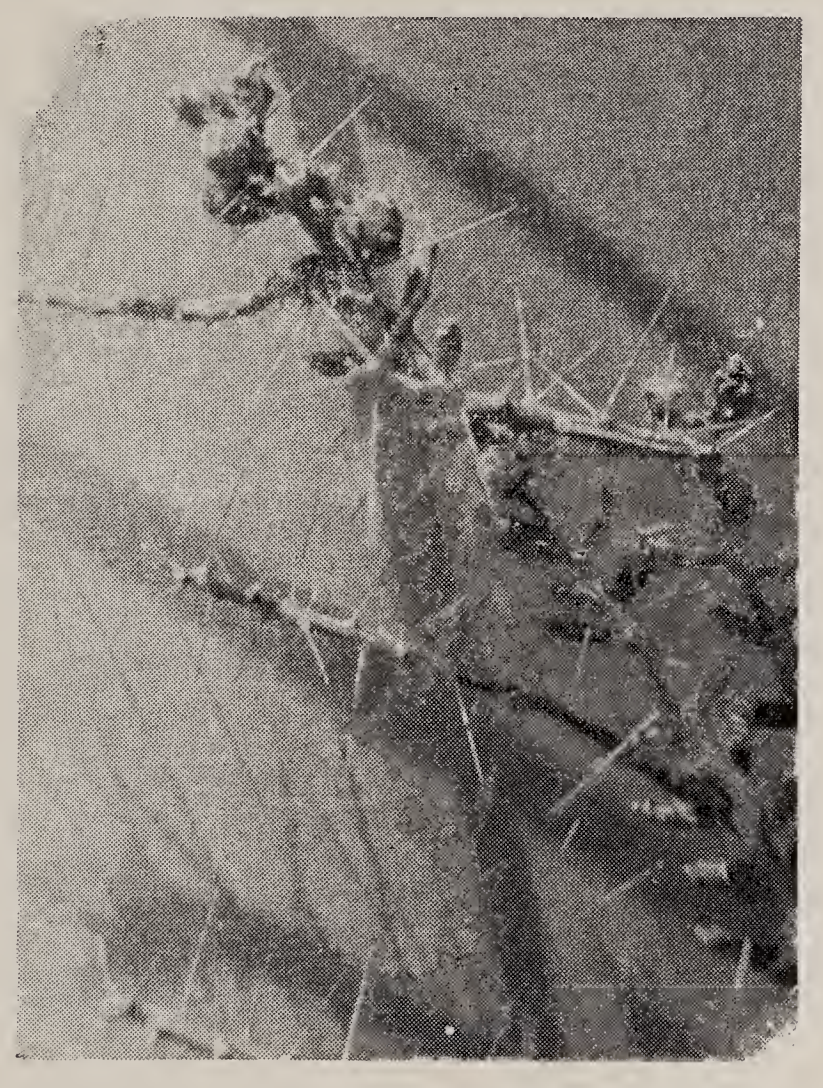
THE NOVEMBER MEETING OF THE CACTOMANIACS WILL BE HELD NOVEMBER 5th AT 8:00 P. M. IN THE WEBSTER AUDITORIUM. MANUEL DIAZ, CHANDLER, ARIZONA, WILL HAVE CHARGE OF THE MEETING. TOPIC TO BE DISCUSSED IS MAMMILLARIAS.

The Book Store has many desirable items of the Southwest that would make excellent Christmas gifts: books, cactus plants, prickly pear candy, prickly pear jelly, Kachina dolls and Christmas cards. Write for a price list.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

DECEMBER, 1957



Opuntia leptocaulis in fruit, Arizona's Christmas Cactus. The brilliant red fruits look like Christmas tree decorations in December.

REG MANNING

SAGUAROLAND BULLETIN

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W. HUBERT EARLE, Editor

Volume 11 DECEMBER, 1957 No. 10

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The Book Store has many desirable items of the Southwest that would make excellent Christmas gifts: books, cactus plants, prickly pear candy, prickly pear jelly, Kachina dolls and CHRISTMAS CARDS. Write for a price list.

GARDEN OPEN DAILY 9 A. M. TO 5 P. M. INCLUDING HOLIDAYS

Feliz Navidad y Feliz y Prospero Ano Nuevo

TO ALL OF THE MEMBERS OF THE GARDEN
FROM THE: — OFFICIAL BOARD
ADVISORY BOARD
GARDEN STAFF

NOVEMBER IN THE GARDEN

This has been the busiest November in the history of the Garden in terms of visitors, activities and correspondence. Attendance is up 40% due to many persons visiting the Garden who are attending conventions in the Valley.

Twenty to 25 very interested persons are attending the Wednesday 3 P. M. classes on a "Better Understanding and Growing of Desert Plants." This class will complete its course Dec. 11th with a field trip in the desert for additional identification work. Additional courses will be given Jan. 8th and the first Wednesday in March.

We were fortunate to have some unexpected rains a few weeks ago with the result that the Garden looks lush and clean and the cactus have become alarming turgid. The Succulent Milkweeds of Africa (Stapeliads) have been putting on a good show and will continue for another month. The stone-face succulents (Lithops) will continue blooming for another six weeks. Desert crownbeard (Verbesina encelioides) and the Desert Marigold (Baileya multiradiata) have also been adding a great amount of yellow color.

The lectures on Thursday afternoons at 3 P. M. have been well attended and the illustrated subjects for December are as follows:

Dec. 5—National Monuments in Arizona.
Dec. 12—Indians of Arizona.
Dec. 19—Points of interest in Arizona.
Dec. 26—Succulents of African deserts.

CULTURE OF CACTUS CUTTINGS

One of the easiest methods of acquiring new cactus plants 'already-grown' is to take cuttings off of your plants or save the stems that are accidentally broken off.

Stems or branches should be cut off during dry periods with a very sharp knife and the cut portions of the plant and the cutting dusted with powdered sulphur or ground charcoal to offset any possibility of infection and to hasten drying or callusing.

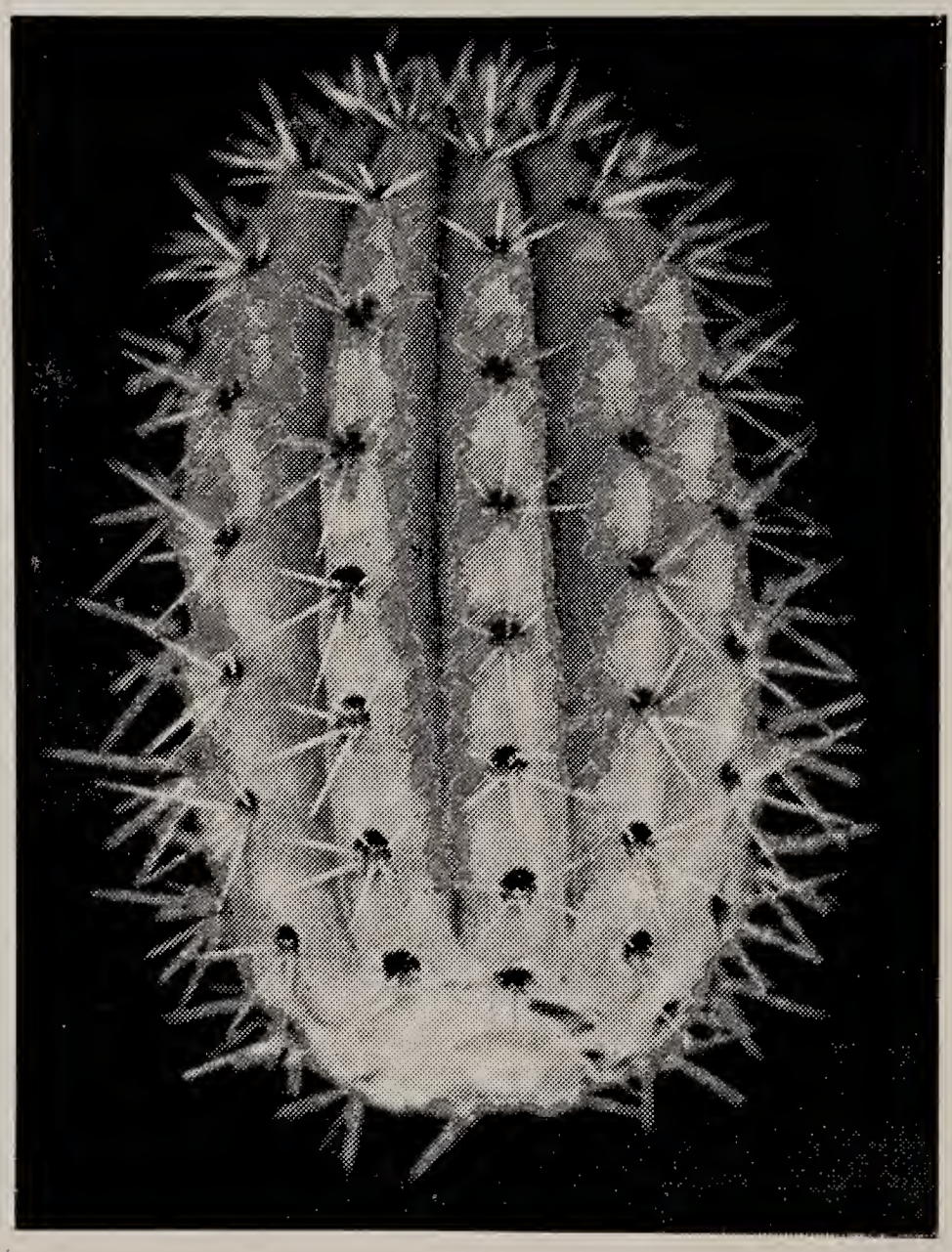
The cutting should then be placed on a shelf away from the direct sun to dry for a week or two until a firm callus is developed. Plant the cutting in a pot of dry sand after it is well callused and leave it alone for several weeks or until the meristem (growing portion or tip of stem) shows new growth. Then remove the cutting and inspect for new roots beginning to immerge from the callused area. If new roots are beginning to show then replant the cutting in a pot

of your regular growing earth mixture and water the plant as you would your other cactus.

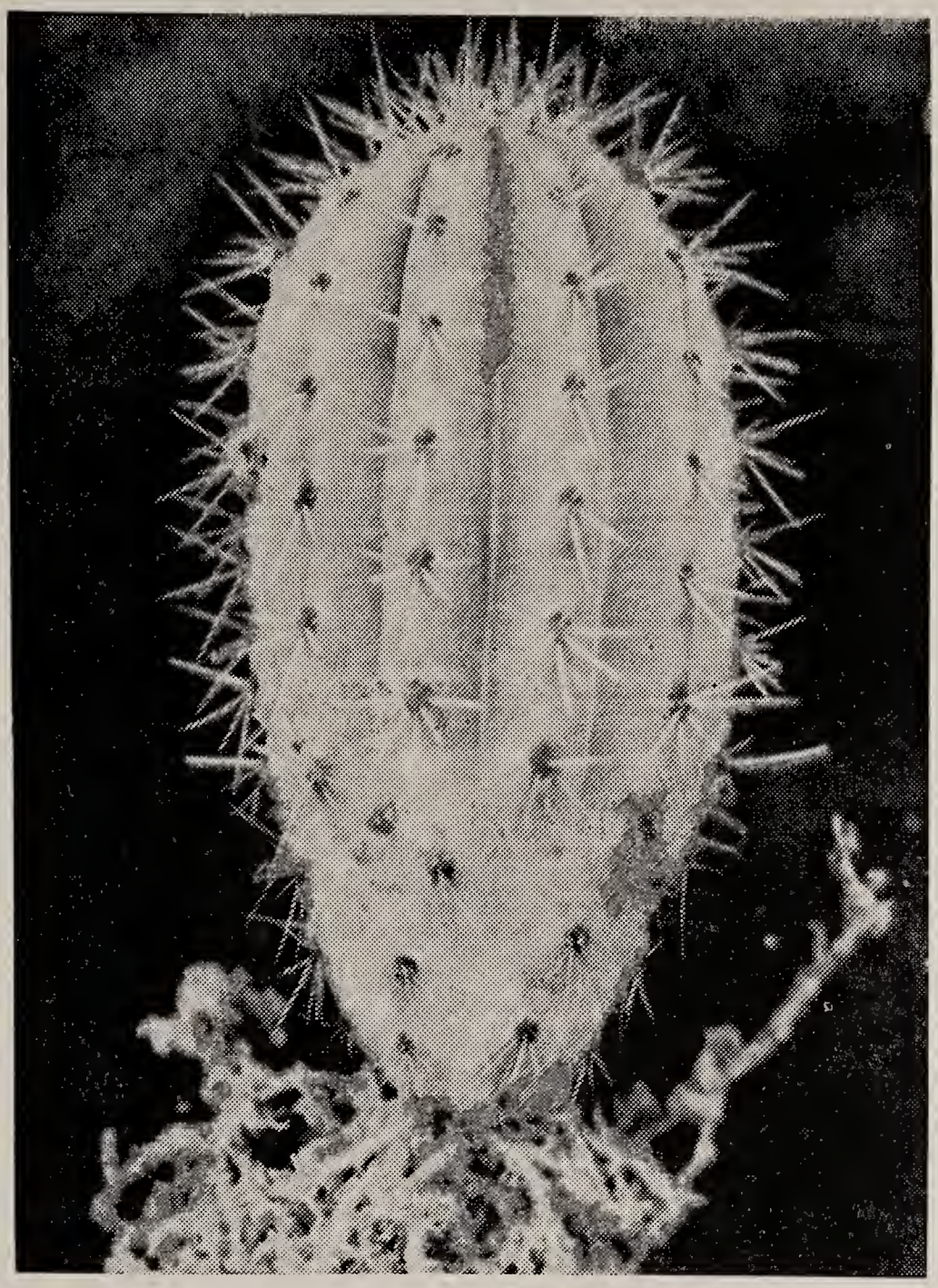
Occasionally some of the cuttings take a long time to form new roots and begin to dehydrate. These should then be given a small amount of water to soften the callus and prevent its "drying-out.' Since the cutting is in sand the water will not adhere to the cutting too long and will then drain out of the pot.

During the rooting period the cuttings should have light but not the direct sun as the latter tends to dehydrate the cutting and will slow-up its efforts to make new roots.

Small offsets from Echinopsis, Rebutias, Lobivias, etc., will root readily if placed directly on the ground and held in place by angled toothpicks as per illustration.



Lemaireocereus thurberi (Organ Pipe) offset X 2/3. Ready to be set in pot of sand to develop roots.



Lemaireocereus thurberi offset that has developed a bunch of roots after it had been in ground for one year. X 2/3.

Echinopsis offset held firmly against ground so that roots will seek the ground readily.

A Douglas

CHAPARRAL — WHAT IS IT?

Several times a week, visitors to the Garden ask us to point out to them the 'Chaparral-bush'.

In Mexico there were two trees called 'chaparro'—an evergreen oak (Quercus reticulata) and an acacia (Acacia amentacea). These trees grew in thickets and the latter was very spiny so the early Spanish explorers began calling these thickets 'chaparrals'. Since then, all plants of the deserts and higher elevations that grew in thickets, had spiny leaves, spines, prickles or pinnated stems have been called 'chaparral'.

Interestingly the 'chaps' worn by horsemen working cattle thru thickets of trees or shrubs, is an abbreviation of the word 'chaparral'. They were worn to protect the rider by warding off the thorns, spines or spiny branches in the thickets. In some parts of South America, horsemen have a leather sheild or 'chap' strapped over the forequarters of their horses so that they can travel thru impregnable thickets.

Within the following plates of illustrations are some of the plants we find in our desert that are considered 'chaparral'. In the lower deserts we find the following:

Crucifixion-thorns: Holacantha emoryi, Canotia holacantha and Koberlinia spinosa

Palo-verdes: Cercidium microphyllum, Cercidium floridum and Parkinsonia aculeata.

Mesquites: Prosopis julifora and Prosopis pubescenes (screw-bean).

Buckthorne: Condalia lycioides, Condalia mexicana.

Desert-thorn: Lycium andersonii, Lycium fremontii, Lycium pallidum.

Ironwood: Olneya tesota.

Acacias: Acacia greggii, Acacia farnesiana, Acacia constricta.

Desert-hackberry: Celtis pallida.

Salt-bush: Astriplex canescens.

Ocotillo: Fouquieria splendens

In the higher deserts we find the following:

Locust: Robina neomexicana

Barberry: Berberis trifoliolata, Berberis haematocarpa and Berberis fremontii.

Oaks: Quercus gambelii, Quercus turbinella.

There are many other trees and shrubs that should be mentioned but this will give you a good idea of the most outstanding ones that are called 'chaparral.'

Desert Trees (opposite page)

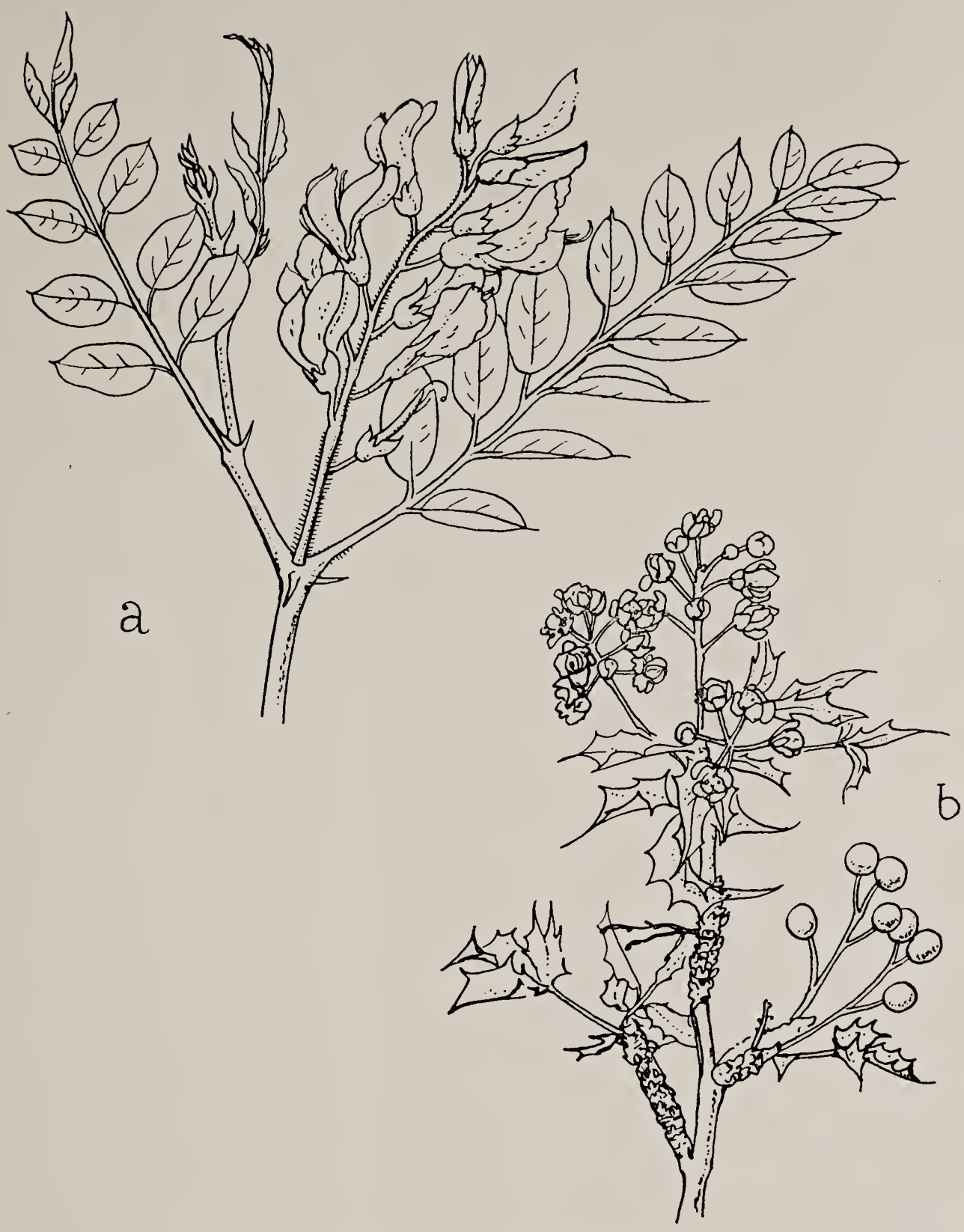
(a) Blue Palo Verde (Cercidium floridum). Deciduous tree, fl. yellow, March-May. Alt. 3500-6000 ft. 2/3 n.s.

(b) Ironwood (Olneya tesota). Evergreen or deciduous tree, fl. violet-purple, May-June. Alt. 2000-4000 ft. natural size.

(c) Mesquite (Prosopis juliflora). Deciduous tree, fl. yellow, April-June. Alt. below 5000 ft. fl. enlarged X10. Spray and pods natural size.

Drawings by Art Douglas.

a
b
c
d



Plants of the Higher Altitudes

(a) New Mexico Locust (Robinia neo-mexicana). Deciduous tree, fl. purplish-pink, May-July. Alt. 4000-8500 Ft. 1/2 n.s.

(b) Barberry (Berberis fremontii). Evergreen shrub, fl. yellow, May-June, berries blue-black or purple. Alt. 4000-7000 ft. 1/2 n.s.

Desert Shrubs and Trees (opposite page)

(a) Crucifixion Thorn (Holacantha emoryi). Tree, leafless in its mature form, fl. inconspicuous, yellow-green, June-July. Alt. below 2000 ft. 1/2 n.s.

(b) Desert Willow (Chilopsis linearis). Evergreen, shrubby tree, fl. white to lavender, violet-scented, April-August. Alt. up to 5000 ft. 1/2 n.s.

(c) White-Spined Acacia (Acacia constricta). Deciduous shrub, fl. golden yellow, Spring and Summer. Alt. 2000-4500 ft. 2/3 n.s.

THE ELEPHANT TREES OF THE SOUTHWEST

JAY EGBERT, Phoenix Arizona

A letter read recently over the radio recited the interesting experiences of an adventurer exploring in his jeep the desert wastes of Southern California. At Fish Creek Canyon near Split Mountain he had come upon a wondrous stand of elephant trees, "37 of them, the only trees of the kind," he said positively, "north of the Mexican border." He may have been quoting a guidepost.

As a student of these trees I had long been intrigued by the stories of their growth and habits, so in April, 1951, I set forth from Phoenix with a young friend, Gordon Yates, in a jeep to gain first-hand information and to collect seeds at this northerly latitude.

Knowing there was a stand somewhere in the south part of the Sierra Estrella Range some 20 miles from Phoenix we turned into a rough trail through the chaparral at the north edge of Hidden Valley, and after a few miles my field glasses dotted the higher spots of a steep rocky slope with the strange trees I was seeking. The ridge was composed of great blocks of schist. In July these trees would be known by their pink and white blossoms and would drop their seeds with the change of seasons, their blossoming and fruiting time beginning at the lower levels. I sent Gordon ahead to the top of the ridge where seeds might be hanging latest, while I lingered amid a group of trees to make observations.

The largest tree had a trunk about 11 - 12 inches thick measured on the face of the rock, out of which it actually appeared to grow. There was no visible opening nor even a crack in the rock that I could detect, to suggest rooting. Five inches above the rock base four scraggly branches took off, each three or four inches thick. The branches were tapered and curved in a manner suggestive of elephants' trunks. Six inches above these was another whorl of branches two or three inches thick. The tree had a height of eight feet and a width of 15 feet, and this proportion of height to width seemed typical. The leaves are compound and compare with mesquite. They are deciduous, and we caught the new spring foliage. The twigs that had been frosted were reddish brown. The older wood had an outer bark almost white; it was peeling and in that state looked like scuffed and torn tissue paper. The second layer was green and a slight scratching with a pocket knife exposed an inner spongy layer of reddish brown.

There were evidences that the trees were tremendous rock splitters. One of them with a four-inch trunk had one side of its root crown resting on the edge of a rock, its three roots stretching below for 30 inches before entering a crevice. Clearly the roots had cracked the rock through, and one section, shaken perhaps by an earth tremor, had tumbled farther down the slope. Another tree with a three-inch trunk stood on its roots which were unsupported at the crown or for two feet below. The rock which once had afforded a resting place for a seed in a spoonful of silt blown up from the desert floor had finally been conquered by the tiny seed. The parts of the broken rocks, resting less securely, had succumbed to the leveling agency of these trees and had rolled to new resting places. This is a perfect illustration of how mountains cast up by thousands of years of crustal pressure are brought low again by such inevitable processes.

Bursera microphylla (Elephant tree) growing amongst large granite boulders in the Sierra Estrella Mts. S/W of Phoenix.

I realized that the sun would soon drop below a high point, and early darkness endanger our descent; I was thinking we would have to return in a few days and have more time to search for the precious seeds, when Gordon showed up. With the muscles and zest of youth he had gone to the crest while I was making observations. He had lost his footing and had fallen once about eight feet; but with great luck he had come upon a single tree, parts of whose dried clusters of three-angled red drupes were still hanging. There were 24 seeds.

I divided them between the Desert Botanical Garden at Tempe and the Southwestern Arboretum. One seed germinated at the Botanical Garden, and the plant is now nearly two feet in height. It is still in the lath house.

Elephant trees are also common in the Salt River Range just south of Phoenix, where they were identified by Frances L. Hamilton in 1933 in her Master of Science thesis for the University of Arizona.

In 1860 this strange tree genus, distinguished by its oddities, was found along the coasts of the Gulf of California, and was brought to the notice of botanists. They gave it its authenticated botanical name honoring a 17th century German botanist, Joachim Burser. There are two species, Bursera microphylla and Brusera odorata. The crushed herbage of either species has the odor of tangerine peel. The latter has a stronger odor and larger leaves. It occurs, in one place north of the border, Fresnal, Arizona, at an elevation of 4,000 feet on the western slope of the Baboquivari Range. The species Bursera microphylla was not found in the United States until 1910.

It seems a mysterious "desert rat" turned up in a San Diego tavern with a story of a fabulous group of trees come upon while prospecting a gypsum mine in the eastern foothills of San Diego County. He pictured the trees as having several colors of bark—tissue-thin white, then layers of green—and an inner bark of spongy red which

Bursera microphylla branch showing leaves and fruits

"bled like an animal, when cut." The branches were curved like elephant trunks! The prospector left a rough pencilled map with one Edward H. Davis, showing the location. (Directions now are: Turn south at Ocotillo on Route 78, proceed 12 miles to Navy Air Base, 5 miles more to marker "Elephant Tree Area.") Another prospector in 1920 spread the same rumor. In 1937 members of the Scripps Institute of the San Diego Museum of Natural History took the rumor seriously and set forth with E. H. Davis and his map. They located the colony and identified the trees botanically as Bursera microphylla.

Elephant trees have for years been known on at least fifteen ranges in Arizona from the Salt River Range and Sierra Estrella Range, close to Phoenix, to the Gila, Tinajas and Atlas Ranges near Yuma. The late superintendent of the Organ Pipe National Monument recently wrote me, "There are elephant trees on all of the ranges in southwestern Arizona from the Baboquivari Range west and north to the Kofa Mountains. I have had reports of them from the Kofas. They are found on the southerly barren slopes at elevations of 2,200 to 3,500 feet."

The Great American Desert in which we live was not always a desert. As moisture-laden winds from the Pacific were cut off by the gradual upheaval of mountain ranges perhaps a million or more years ago it became necessary for plant life to adjust itself to an increasingly arid climate or else disappear. As the climate became drier nights became frostier, and the elephant trees which had multiplied tremendously under humid conditions were now having their boughs frosted back. Today they are markedly frost-tender, and though stubbornly resisting the double enemies of frost and aridity they are being swept back, through the centuries, toward Mexico, their original habitat.

Thus may eventually pass our fabulous tree from the Southwestern scene.

THE DECEMBER MEETING OF THE CACTOMANIACS WILL BE HELD DECEMBER 3rd AT 8:00 P. M. IN THE WEBSTER AUDITORIUM. CHARLES MIEG OF SCOTTSDALE WILL ARRANGE THE PROGRAM. HE HAS JUST RECENTLY RETURNED FROM A COLLECTING TRIP IN MEXICO, ACCOMPANIED BY DR. GEO. LINDSAY AND DR. REID MORAN.